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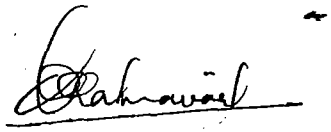
In Memory of My Departed Father

FOREWORD

I have gone through the manuscript thoroughly and have pleasure in recommending the book entitled **'MULTIPLE CHOICE QUESTIONS AND SOLUTIONS FOR MINING PROFESSIONALS'** for the Students and Mining professionals. The effort made by Dr. Netai Chandra Dey, Professor, Department of Mining Engineering, Bengal Engineering & Science University, Shibpur leading to documentation and publication of this valuable compendium is appreciable and commendable.



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CHAPTER - 1

MINING METHODS

(This part includes questions from coal and metal mining methods including questions from mineral economics and mining engineering related questions in general)

1. **What is the main reason to support a slip or fault plane on its both sides?**
   a) it is a weak zone of the mine
   b) a slip or fault plane is the line of fracture of strata & very difficult to hold it
   c) it indicates the weaker section of the district
   d) none of them

2. **Why do we close the stoppings on intake & return airways simultaneously?**
   a) to prevent coal dust explosion
   b) to withdraw man & machine from the district
   c) to prevent methane explosion by delaying the possible formation of an explosive mixture
   d) none of the above

3. **Water spraying at coalface before & after short firing is mandatory, why so?**
   a) in order to guard against the explosion hazard of coal dust
   b) to prevent the formation of coal dust cloud
   c) both of them
   d) none of them

4. **Why fleet angle is limited to 1.5°?**
   a) to reduce the side travel on the pulley
   b) to prevent excessive wear & tear of the winding rope
   c) it allows maximum persons to travel at a time in a
   d) it allows use of rope having lesser diameter

5. **Why the heavy type of stone dust barriers are located further from faces in a district**
   a) it needs more stone dust to erect
   b) it requires maximum time to install
   c) light type of stone dust barriers are in the face
   d) the greater distance will give the explosion the opportunity to develop greater violence to topple the heavy barriers

6. Maximum supports are required within 10 m of freshly-exposed roof- why?

a) maximum person are there in he face
b) that portion generally remain unsupported due to violence of blasting & incumbent strata pressure is shifted towards pillar edge
c) this is the only place of working in the district in a mine
d) it is easy to install supports at the face

7. Maximum accidents in India is caused due to

a) roof fall
b) inundation
c) gas explosion
d) fire

8. Roof fall accidents are caused due to

a) no support given at the face
b) insufficient support and delay in erection of support
c) maximum concentration of workers is there at the face
d) blasting and misfired shots

9. Roof fall accidents can be minimized by

a) formulation of SSR and proper implementation of the support rule
b) minimizing the entry of manpower in the mine
c) by proper supply of support items
d) none of the above

10. It is very difficult to control shaley roof if coal is not left with the shale- why?

a) it is weak in nature
b) it has weathering effect
c) it has great affinity to absorb moisture and get departed from immediate roof
d) it reacts with coaly surface

11. Use of oxyacetylene flame wielding/cutting can be done in 3rd degree gassy mine, if

a) permitted in writing by Agent
b) permitted in writing by Manager
c) permitted in writing by Owner
d) permitted in writing by Director of Mine Safety

12. One of the main criteria to decide the size of Panel for depillaring is

a) construction of artificial panels
b) incubation period of coal seam

c) depth of cover
d) systematic support rule of the panel

13. The number of workmen's inspector in a large u/g coal mine

a) 1 b) 2
c) 3 d) 4

14. Intrinsically safe apparatus is such an apparatus

a) which is inherently incapable of creating spark of sufficient intensity to ignite firedamp
b) which is safe in operation as no hot gases comes out of it
c) it is operated at a lower level of temperature
d) it has an overload protection

15. 'Gravimetric Dust Sampler' samples dust laden air at a flow rate of 'A'. A is given by

a) 1l/min b) 2.5l/min
c) 4l/min d) 5l/min

16. 'Gravimetric Dust Sampler' is

a) intrinsically safe apparatus
b) FLP
c) it has both the features
d) none of the above

17. Which types of detonators are recommended to use with Permitted explosives during blasting off the solid?

a) ordinary detonators
b) non-incendive alumina detonators
c) non-incendive copper short delay detonators
d) non-incendive iron capped delay detonator

18. What percentage of (CO formed/O_2 absorbed) ratio indicates existence of heating?

a) 0.5% b) 1%
c) 2% d) 3%

19. Why different types of explosives are not normally charged in the same shot hole?

a) less output per round of blasting
b) chances of misfire
c) chances of explosion
d) cost of blasting will be maximum

20. Why outlets from a mine are not provided closer than 13.5 m?

a) for quicker intercommunication
b) for easier pit top arrangement
c) closer outlets will weaken the shaft pillar causing possibility of leakage
d) there may be possibility of subsidence

21. Manpower distribution plan should not show one of the following. Identify it—

a) name of districts
b) the month to which the plan relates
c) categories of persons and OMS of the district
d) total number of persons employed in underground

22. What is the rate of stone dust loading per meter of shelf length for heavy type barriers?

a) @ 30 Kg/m length of shelf
b) @ 65 Kg/m length of shelf
c) @ 100 Kg/m length of shelf
d) @ 150 Kg/m length of shelf

23. What is the rate of stone dust loading per meter of shelf length for light type barriers?

a) 10 kg
b) 20 kg
c) 30 kg
d) 40 kg

24. How much of stone dust is required per square meter cross- sectional area of gallery for light type of barriers?

a) 30 kg
b) 70 kg
c) 110 kg
d) 150 kg

25. How much of stone dust is required per square meter cross- sectional area of gallery for heavy type of barriers?

a) 250 kg
b) 320 kg
c) 390 kg
d) 460 kg

26. What is the suitable distance of location of heavy type of barriers from farthest face?

a) 265 m
b) 365 m
c) 465 m
d) 600 m

27. The cap lamp used by the miners is—

a) intrinsically safe
b) flame proof
c) neither intrinsically safe nor flame proof
d) adequate to produce spark

28. One of the important safety feature of cap lamp is

a) cartridge type silver fuse is incorporated
b) arrangement to restrict excessive current flow in the event of short-circuit
c) both of the above
d) none of the above

29. What should be the minimum insulation resistance of medium power cable?

a) 0.5 mega Ohm
b) 1 mega Ohm
c) 1.5 mega Ohm
d) 10 mega Ohm

30. What should be the minimum insulation resistance of high power cable?

a) 10 mega Ohm
b) 15 mega Ohm
c) 25 mega Ohm
d) 50 mega Ohm

31. How much quality of air should be conducted up to each face where solid blasting is practiced?

a) 244 m^3/min
b) 264 m^3/min
c) 284 m^3/min
d) 400 m^3/min

32. Which of the following appliances is used to give suitable curvature to a track line?

a) Backstay
b) Jim crow
c) Drop war wick
d) Smallman clips

33. Longwall mining method is best suitable for

a) flat & moderately flat seam
b) steeply inclined seam
c) fractured and geologically disturbed seam
d) seam with high cavability index

34. Quick production can be achieved from

a) retreating long wall mining method
b) advance long wall mining method
c) jankowice method
d) both advancing and retreating method

35. Prior to installation of a longwall equipment at face, the face is to be developed by Road headers in

a) retreating long wall mining method
b) advance long wall mining method
c) both advancing and retreating method
d) conventional longwall

36. Value of Bulking Factor is

a) 0 b) 0.5
c) 1 d) More than 1

37. In Indian longwall mines, support resistance is calculated with due consideration to

a) convergence of the strata above coal seam
a) face length
b) panel length
c) height of the immediate roof

38. Minimum air velocity required at longwall face is

a) 30 m/min b) 60 m/min
c) 90 m/min d) 120 m/min

39. First generation powered support is

a) chock shield
b) shield
c) frame
d) chock

40. Power pack is provided at long wall face to give pressure to

a) powered support
b) armoured flexible conveyor
c) double ended ranging drum shearer
d) stage loader

41. Ratio of water and emulsion in hydraulic fluid is

a) 99 : 1 b) 95 : 5
c) 50 : 50 d) 25 : 75

42. Setting pressure and yielding pressure is related with

a) powered support
b) armoured flexible conveyor
c) double ended ranging drum shearer
d) Stage loader

43. Advance supporting of 30 m at both the gate roads is required due to

a) front abutment pressure
b) back abutment pressure
c) both front and back
d) yield pressure

44. Load cell and convergence recorder is used

a) in powered support
b) at both gate roads

c) at shearer machines
d) at armoured flexible conveyor

45. With low setting pressure

a) line of breaking remains at the rare part of the canopy
b) face becomes more productive & safe
c) cavity occur in between canopy tips and face
d) caving of strata becomes regular

46. Ring main in hydraulic system is used to

a) get uniform pressure in powered support
b) get better performance of the shearer
c) set better coal evacuation system
d) get uniform loading in armoured flexible conveyor

47. Which of the following occur first in underground coal mines?

a) periodic fall
b) main fall
c) local fall
d) air blast

48. Setting of unloader valve of power pack can be changed by

a) section fireman
b) section engineer
c) colliery engineer
d) manufacturer

49. Positive Set Valve (PSV) is used to overcome the operator error in

a) armoured flexible conveyor
b) double ended ranging drum shearer
c) stage loader
d) powered support

50. SIVAD unit is mainly used at Indian long wall face to operate

a) armoured flexible conveyor and stage loader
b) power pack
c) shearer machine
d) all machine at long wall face

51. Over 90% of underground coal production in India comes from

a) longwall method
b) hydraulic mining method
c) bord & pillar method
d) blasting gallery method

52. Which of the below-mentioned coal subsidiary of Coal India Limited has no undergound mine?

a) CCL
b) BCCL
c) NCL
d) WCL

53. Bhaska & Tipong method was practiced in

a) SECL
b) NECL
c) CCL
d) WCL

54. Chances of Over- riding of gallery is most with

a) shortwall method
b) longwall method
c) widestall method
d) blasting Gallery method

55. Where the telephones or electrical signals are provided, the signal wires shall be supported on insulators and shall not be energized at more than

a) 20 V
b) 30 V
c) 60 V
d) 125 V

56. As per Indian Electricity Rules, where hand-held portable apparatus is used, the voltage should not exceed

a) 30 V
b) 75 V
c) 125 V
d) 250 V

57. The term 'Lay' in wire rope is used to denote

a) weight of wire rope
b) direction of laying of wires
c) space factor of rope
d) direction of movement of rope.

58. 'Drop-war-wick' is used in u/g haulage track as a means of

a) coal lifting device
b) safety arrangement
c) tub coupling
d) super elevation of track

59. Which of the following is an item of u/g coalmine support

a) stop-Block
b) pit Prop

c) jim-Crow
d) back-stay

60. The process that sends sand water mixture in underground coal depillaring district is known as

a) jigging operation
b) gravity separation operation
c) stowing operation
d) coal drawing operation

61. 'Run away switch' is used in connection with

a) direct rope Haulage
b) endless Haulage
c) gravity Haulage
d) tail rope Haulage

62. No winding rope, which has been in use for more than 'A' years, shall be used for winding purpose. A is given by

a) 2.5 yrs
b) 3 yrs
c) 3.5 yrs
d) 4 yrs

63. The track gauge width used for direct rope haulage in underground coalmine is

a) 0.6 m
b) 0.8 m
c) 1.0 m
d) 1.1 m

64. A coal seam in India is said to be thick when the thickness is more than

a) 1.5 m
b) 2.5 m
c) 3.5 m
d) 4.5 m

65. A road in a proper coal seam is called

a) travelling road
b) gallery
c) drift
d) haulage Road

66. Rocks are 'massive' when bedding planes are more than "A"m apart. A is given by

a) 0.4 m but less than 0.6 m
b) 0.6 m but less than 0.8 m
c) 0.8 m but less than 1.2 m
d) more than 1.2 m

67. When an underground gallery is driven, the equilibrium of pre-mining forces is disturbed and re-distribution of pressures takes place. This can be better-explained by

a) suspension theory
b) pressure–arch theory
c) beam theory
d) key stone theory

68. The full form of 'SSR' is

a) safari support of roof
b) steel support recovery
c) solid support rating
d) systematic support rule

69. The full form of 'RMR' is

a) roof mass recovery
b) roof measurement rules
c) rock mass rating
d) round mass recovery

70. Chances of 'Span failure' is maximum for

a) wider gallery
b) narrow gallery
c) staggered gallery
d) blasting gallery

71. Which of the following hazards is met when the roof exposure during depillaring operation becomes more than 90 m^2 ?

a) coal bump
b) air blast
c) subsidence
d) explosion

72. The common rate of sand stowing in u/g coal mine is A tons of sand per hour. A is given by

a) 100 b) 500
c) 1000 d) 1500

73. P-5 explosives are used for

a) pre-cut blasting
b) solid blasting
c) open cast blasting
d) over burden blasting

74. Side Discharge Loader (SDL) is a

a) crawler mounted machine
b) tyre mounted machine
c) both a & b
d) rail mounted machine

75. 'Loop- take- up' arrangement is associated with

a) scraper chain conveyor
b) shaker conveyor
c) belt conveyor
d) cable belt conveyor

76. Which type of drilling pattern is generally followed in solid blasting face?

a) burn cut
b) cormorant cut
c) pyramid cut
d) wedge cut

77. 'VOD' is the property of

a) detonator
b) explosive
c) coal cutting machine
d) side discharge loader

78. Maximum Lump size that can be conveyed by belt conveyer is

a) < ½ width of belt
b) > ½ width of the belt
c) any lump size
d) depends on belt speed

79. The method of joining rope is known as

a) rope stitching
b) rope splicing
c) rope stretching
d) rope vulcanizing

80. Manhole should be provided along the haulage length at every 'A' meter distance. A is given by

a) 20 b) 50
c) 120 d) 200

81. Over speeding of coal tubs are restricted by

a) mono rail
b) jazz rail

c) driving wheel
d) friction wheel

82. In Khaskaranpura, the cutting of narrow drivages with the help of coal picks is known as

a) primary cutting
b) secondary cutting
c) mul cutting
d) pyramid cutting

83. Spiral attachment with the jib of CCM is known as

a) hauler
b) gummer
c) sumper
d) propeller

84. Which types of cables are used in portable & transportable apparatus?

a) armoured cable
b) flexible cable
c) pilot cable
d) bi-cable

85. In hydraulic mining the coal pulp is carried by

a) flumes
b) belt conveyor
c) coal tub
d) scraper haulage

86. Breaking of coal in 'Hydraulic mining' is done by

a) coal drill
b) jet monitor
c) coal cutting machine
d) blasting

87. 'Soutirage' mining is the other name of

a) sub level caving
b) horizon mining
c) integral caving
d) depillaring with caving

88. The term 'Impeller' is mainly associated with

a) booster fan
b) auxiliary fan
c) pumps
d) drill machines

89. The current OMS in Indian underground coal mine is

a) 0.56 b) 0.96
c) 1.46 d) 2.0

90. Shale as immediate roof in underground coal mine is not suitable because

a) It is difficult to support
b) It gives less waning prior to fall
c) It has high affinity to moisture & departs from roof easily
d) It gives bad sound while testing

91. According to CMR, what is the maximum permissible charge per hole?

a) 265 gm b) 365 gm
c) 465 gm d) 565 gm

92. Which type of drilling pattern is followed in Blasting Gallery Method?

a) ring pattern
b) burn cut pattern
c) wedge cut
d) coromant cut

93. In contiguous seam working, the 2 seams must be within A m of each other. A is given by

a) 24 m b) 18 m
c) 12 m d) 9 m

94. What should be the water requirement in hydraulic mining method, if the dip of the seam is more than 45° ?

a) 1 m^3/ton of coal
b) 2 m^3/ton of coal
c) 4 m^3/ton of coal
d) 6 m^3/ton of coal

95. Methanometer works on the principle of

a) Darwin
b) Wheat stone bridge
c) Keystone
d) Graham's law

96. Which of the following gas in known as 'Marsh Gas' ?

a) H_2S
b) CH_4
c) NO_3
d) CO

97. Which gas is synonymous with 'White damp'?

a) CO
b) H_2S
c) CH_4
d) N_2

98. Which gas is synonymous with 'Fire damp'?

a) H_2S
b) CH_4
c) CO
d) H_2

99. Existence of fire in underground coal mine is established by

a) Charle's law
b) spot coolers
c) Graham's ratio
d) self rescuer

100. Friction Clutch is used for

a) tail rope haulage
b) endless haulage
c) belt conveyor
d) scraper chain conveyor

101. In a 2nd degree gassy mine the velocity of air measured at the maximum span of long wall face should be

a) 15 m/min
b) 30 m/min
c) 45 m/min
d) 60 m/min

102. Permissible limit of respirable concentration of coal dust should not be more than

a) 3 mg/m^3
b) 6 mg/m^3
c) 10 mg/m^3
d) 15 mg/m^3

103. The costliest stoping method is

a) cut & fill method
b) square set
c) sub-level
d) block caving

104. V.C.R is a modified version of

a) sub-level
b) cut & fill
c) block caving
d) stope & pillar

105. As per Mine Rules 1955 every shelter shall have a floor area of not less than

a) 10 Sq. m
b) 12 Sq. m
c) 14 Sq. m
d) 16 Sq. m

106. For what depth of coal seam from surface, the distance between centers of adjacent pillars shall not be less than 45 m for a gallery width of maximum 4.8 m

a) 60-90 m
b) 90-150 m
c) 150-240 m
d) 240-340 m

107. No locomotive shall be used where the gradient of the track exceed

a) 1 in 6
b) 1 in 8
c) 1 in 12
d) 1 in 15

108. At every below ground mine where more than 'A' Persons are ordinarily employed belowground and there is no rescue station within its radius of 35 Km, the Owner shall establish a rescue room near the mine entrance. 'A' is given by

a) 25
b) 50
c) 75
d) 100

109. The Draw point spacing in caving method is dependent on

a) mechanisation used
b) length of the stope
c) area of influence of the draw points
d) size of the ore broken

110. As per IER, the length of flexible cable used in portable and transportable apparatus shall not be more than

a) 50 m
b) 100 m
c) 200 m
d) 300 m

111. Gassy seam of 'third degree' means a coal seam or part lying within the precincts of mine not being an opencast working where the rate of emission of inflammable gas per tone of coal produced exceeds

a) 1 Cum
b) 10 Cum
c) 20 Cum
d) 100 Cum

112. Every part of underground coal mine which is not naturally wet or which is not isolated by explosion-proof stopping shall be treated with the incombustible dust having not more than the following % of free silica

a) 5%
b) 10%
c) 15%
d) 20%

113. The Automatic Contrivance shall be provided in each shaft exceeding a depth of
   a) 50 m b) 70 m
   c) 90 m d) 100 m

114. In a 3rd degree gassy mine the velocity of air measured at 7.5 m out bye of the discharge end of an air pipe should be
   a) 25 m/min b) 45 m/min
   c) 60 m/min d) 75 m/min

115. Where any person is allowed to work or pass while the haulage is in motion, manholes for refuge shall be provided at intervals of not more than
   a) 6 m b) 10 m
   c) 20 m d) 30 m

116. In case of metalliferous mines, if depth of a shaft exceeds 1000 m but not 1500 m, no winding rope shall be used or continued in use, if its F.O.S. is or becomes less than
   a) 9 b) 8
   c) 7 d) 6

117. The provisions of Mines Act, 1952 shall not apply (except few sections) to any mine or part where not more than 'n' persons are employed on any day in connection with the excavation. 'n' is given by
   a) 5 b) 10
   c) 20 d) 40

118. In connection with the precautions where gas exists, all apparatus, including portable and transportable apparatus used at any place within 'A' meters of any workings or goaf in case of 3rd degree gassy mine. A is given by
   a) 90 m b) 180 m
   c) 270 m d) 360 m

119. For the purpose of adequate ventilation, in every ventilating district not less than A cu.m per minute of air per daily tonne output is required to pass along the last ventilation connection. A is given by
   a) 1.5 b) 2.5
   c) 3.5 d) 5

120. In respect of every medical examination under rule 29B, the Manager of the mine concerned shall give at least N days prior notice in writing to the persons to be examined. N is given by
   a) 10 days b) 15 days
   c) 20 days d) 30 days

121. Based on the manpower, what should be the quantity of air supposed to flow through the in bye most galleries?
   a) 3 m^3/min b) 6 m^3/min
   c) 9 m^3/min d) 12 m^3/min

122. What should be the minimum floor area of every shelter as per the Mines Rules, 1955?
   a) 14 m^2 b) 15 m^2
   c) 18 m^2 d) 20 m^2

123. What is the minimum requirement of percentage of oxygen at any place in the mine where persons are required to work or pass?
   a) 19.8% b) 19.6%
   c) 19.4% d) 19%

124. What is the minimum size of coal pillar when the depth of coal seam from surface remains between 240m to 360m and gallery width does not exceed 3 m?
   a) 28 m b) 28.5 m
   c) 30 m d) 30.5 m

125. What should be the speed of air current when the wet bulb temperature exceeds 30.5°C ?
   a) 0.5 m/sec b) 0.7 m/sec
   c) 0.8 m/sec d) 1 m/sec

126. Which type of ventilation is preferred for hot and deep mines?
   a) ascensional
   b) descensional
   c) any of the two
   d) both

127. The co-efficient of friction, Kilomurg (kμ) is the
   a) resistance or friction of an airway
   b) friction of water in a pipe
   c) friction of molecule
   d) resistance of electrons in a conductor.

128. Thick, regular and flat seam is highly essential in

a) hydraulic mining
b) wongawilli mining
c) blasting Gallery
d) longwall mining

129. Rack & Pinion is used for

a) large speed reduction
b) to convert rotary motion into a linear motion
c) convert vertical motion to vertical motion in a different angle
d) to reduce and convert linear motion into a rotary motion.

130. Cut & Fill stoping can be done by

a) underhand method
b) overhand method
c) caving method
d) all of the above

131. Crown Pillar is

a) at the top of the stope
b) just above the ore drawing crosscuts
c) on the side of the stope
d) at the base

132. What will happen if a Booster fan is placed too far inbye of the neutral point in either intake or return?

a) a zone of leakage & recirculation will inevitably occur
b) air velocity will increase
c) air velocity will decrease significantly
d) no change will take place

133. The Automatic Contrivance shall prevent the descending cage from being landed at pit bottom at a speed exceeding

a) 1.5 m/s
b) 3 m/s
c) 4.5 m/s
d) 6 m/s

134. In connection with man winding, the approximate floor area per person in a cage shall be

a) 0.1 sq.m.
b) 0.2 sq.m.
c) 0.3 sq.m.
d) 0.5 sq.m.

135. What is the minimum gradient where every tub shall be held effectively by brakes or securely coupled to a haulage rope?

a) 1 in 5
b) 1 in 10
c) 1 in 20
d) 1 in 40

136. Every man-hole shall be kept clean & clear of obstruction, white-washed for a distance of not less than

a) 0.3 m
b) 0.6 m
c) 0.9 m
d) 1.2 m

137. The attachment called 'Backstay' is used with

a) underground haulage
b) locomotive
c) belt conveyor
d) scraper chain conveyor

138. Which metal is used for the purpose of Capping of Winding ropes?

a) Cu
b) Zn
c) Fe
d) Ag

139. No mode or type of Capping shall be used which fails to withstand a load of atleast 'N' times the maximum static load. N is given by

a) 4
b) 6
c) 8
d) 10

140. In connection with lowering or raising of persons by means of bucket etc. for a shaft exceeding 'A' m in depth, there shall be significant cover overhead for protection from things falling down the shaft. A is given by

a) 130 m
b) 190 m
c) 270 m
d) 500 m

141. The point beyond which the mineral/coal can not be economically extracted is called

a) stripping ratio
b) cost of stripping ratio
c) break-even ratio
d) limit of extraction

142. What is the relationship between break-even stripping ratio (BESR) and ordinary stripping ratio (OSR)?

a) BESR < OSR
b) BESR = OSR
c) BESR > OSR
d) no relation

143. Prior to starting opencast working some trenches are excavated to expose the mineral body. These trenches are generally very long but limited in depth. What is its approximate depth?

a) 0.5 m
b) 1 m
c) 1.5 m
d) 2 m

144. The slope angle for hard and compact ground should not be more than

a) 10°
b) 30°
c) 50°
d) 70°

145. In metalliferous mines, during extraction of ore and any other mineral, the working height of the bench shall not exceed A m and angle of slope should not exceed B m from the horizontal. A & B are given by

a) 2 m & 15°
b) 3 m & 30°
c) 4 m & 45°
d) 6 m & 60°

146. In order to get better safety, the optimum gradient of a haul road is

a) 1° – 3°
b) 5° – 9°
c) 15° - 19°
d) > 20°

147. Unless specially permitted by the Chief Inspector of DGMS, no road shall have a gradient steeper than

a) 1 in 3
b) 1 in 6
c) 1 in 10
d) 1 in 14

148. The opening cut in opencast mining is known as

a) berm
b) box cut
c) trench
d) drift

149. The effective position of box cut for a deposit, where ratio of OB : Ore is least should be

a) at boundary of mineral
b) at the middle of the boundary
c) at high seam slope end
d) at any place

150. Which of the following equipment is very common for over casting or side casting?

a) shovel
b) dozer
c) dragline
d) payloader

151. Stacker is commonly used to work in association with

a) dragline
b) bucket wheel excavator
c) shovel
d) payloader

152. It eliminates drilling, blasting in opencast mines and has scope of selective mining. Identify the machine?

a) dozer
b) shovel
c) dragline
d) surface continuous miner

153. Which of the following excavator is preferred to be used for a bench height of 30m or more?

a) bucket wheel excavator
b) shovel
c) front end loader
d) dragline

154. Which of the following excavator will be used for a bench height of 20 m to 30 m in soft rock formation?

a) dragline
b) shovel
c) payloader
d) bucket wheel excavator

155. Can you guess on the minimum production per day by a 10 m^3 electric rope shovel with 85 tonne dumper in India?

a) 500 m^3
b) 1500 m^3
c) 4500 m^3
d) 10000 m^3

156. How much time a dragline may take to complete a cycle for a single pass?

a) 30 sec
b) 1 min
c) 1 min 45 sec
d) 3 min

157. Filling up of the void in opencast mines is known as

a) OB removal
b) trenching
c) reclamation
d) salvaging

158. A loose mineral deposit formed either by chemical weathering at the place of origin or formed by mechanical weathering of the ore body by the stream water. The deposit is known as

a) gravel deposit
b) sedimentary deposit
c) granite deposit
d) placer deposit

159. The process of under water mining of sand, clay, tin and placer deposits of gold is known as

a) hydraulicking
b) dredging
c) placer mining
d) leaching

160. Out of two basic system of leaching, if one is chemical, what is the other?

a) physical
b) mechanical
c) bacterial
d) physico-electrical

161. The ratio of weight per unit volume of solid rock mass in the bench and weight per unit volume of loose rock mass after blasting or loosening is called

a) bucket factor
b) swing factor
c) powder factor
d) swell factor

162. Which of the following factor is considered for calculation of cycle time of excavating machine such as shovel, drag line etc?

a) swell factor
b) bucket factor
c) swing factor
d) drill factor

163. Which of the following is not considered under unsupported class of underground mineral exploitation method?

a) stope and pillar mining
b) shrinkage stoping
c) square set stope
d) sublevel stoping

164. Which of the following method employ horizontal openings?

a) room and pillar mining
b) shrinkage stoping
c) sublevel stoping
d) cut and fill stoping

165. Vertical or steeply inclined openings is suitable for

a) shrinkage stoping
b) cut and fill stoping
c) square set stope
d) stope and pillar mining

166. In room and pillar mining multiple faces are advanced but driving entries or rooms follows a definite pattern known as

a) line of face
b) cut sequence
c) line of pillaring
d) diagonal line of extraction

167. In any underground mining methods cut, drill and blast combined known as

a) face dressing operation
b) coal preparation operation
c) rock mining operation
d) blast mining operation

168. Which of the following belongs to hard rock mining?

a) potash
b) salt
c) trona
d) iron

169. The natural and geological conditions of the mineral deposit are as follows

i) ore strength : weak to moderate
ii) rock strength : moderate to strong
iii) deposit shape : tabular
iv) dip : flat
v) depth : shallow to moderate
vi) cost of mining : moderate

From the options listed below select the optimal or best suited method possible for the available conditions?

a) cut and fill stoping
b) square set stope

c) room and pillar mining
d) all of the above

170. Which of the following method of mining is only applicable to non-coal mines?
a) bord and pillar mining
b) stope and pillar mining
c) sublevel stoping
d) long wall mining

171. A vertical method similar to stope and pillar mining in the supported class is known as
a) stull stoping
b) square set stoping
c) breast stoping
d) shrinkage stoping

172. If the orebody is large, rib pillars are left at the ends (sides) of the stope, a sill pillar at the bottom and a crown pillar at the top. Sometimes these pillars are recovered in subsequent mining. Name the suitable method of mining
a) square set stope
b) underhand stope
c) shrinkage stoping
d) cut and fill stoping

173. Which of the following method is known as vertical crater retreat, VCR (patented) method?
a) bord and pillar mining
b) blasting gallery
c) sublevel stoping
d) shrinkage stoping

174. Ring pattern drill holes are provided in
a) long wall mining
b) bord and pillar mining
c) blasting gallery
d) widestall method

175. Which of the following method may be approaching obsolescence and proved to be the most expensive of all mining methods?
a) square set stoping
b) shrinkage stoping
c) cut and fill stoping
d) blasting gallery

176. The area of working face broken per drill hole is termed as
a) drillability
b) blasting factor
c) drilling factor
d) powder factor

177. It is a subordinate method combining features of both room and pillar and long wall.
a) sublevel
b) widestall method
c) bord and pillar
d) shortwall

178. Which of the following method is applicable to both metallic and non-metallic minerals?
a) stope and pillar
b) bord and pillar
c) blasting gallery
d) sublevel

179. The practice of regulating the withdrawal of ore in the sub-level cross-cuts so as to optimize the economics of the draw is known as
a) sequence control
b) draw control
c) face control
d) gravity control

180. Top slicing is an underhand caving method which is a variation of
a) breast stoping
b) shrinkage stoping
c) sublevel stoping
d) cut and fill stoping

181. It is the mining method in which masses, panels or block of ore are undercut to induce caving, permitting the broken ore to be drawn off below
a) sublevel stoping
b) block caving
c) integral caving
d) sublevel stoping

182. Soutirage mining is the alternative name of
a) sublevel stoping
b) integral caving
c) block caving
d) blasting gallery

183. Which of the following unique mining method is known as novel method?

a) opencast mining
b) methane drainage
c) bord and pillar
d) long wall

184. The range of application of hydraulicking is mostly limited to

a) hard rocks
b) placers
c) coal
d) soft rocks

185. The flow rate of water in hydraulic mining for coal should be at least A gallon per minute. A is given by

a) 50 b) 100
c) 150 d) 300

186. Name the method which involves partial combustion of coal with the objective to extract thermal energy from the coal seam

a) methane drainage
b) underground gasification
c) vertical drilling or raising
d) spontaneous heating

187. In our country a coal seam is classified as thick seam if it is more than

a) 1 m b) 2.5 m
c) 3 m d) 4.5 m

188. Which of the following line of face is mostly followed during depillaring operation in India?

a) step diagonal
b) steep diagonal
c) diagonal
d) semi-circular

189. Sublevel caving with semi-mechanized wire-netting system was first practiced in which of the following colliery in India with the help of French mining engineers?

a) bhurkunda colliery
b) girmint colliery
c) chirimiri colliery
d) gidi- A colliery

190. In solid blasting system the maximum charge in a shot hole should not exceed

a) 150 gm b) 250 gm
c) 335 gm d) 565 gm

191. Which of the following characteristics in blasting gallery method is essential to minimize mixing of waste rocks with coal?

a) flat gradient
b) regular seam characteristics
c) friable characteristics
d) less gassy seam

192. Danger of air blast is maximum with

a) stope and pillar mining
b) cut and fill stoping
c) blasting gallery
d) shrinkage stoping

193. Which of the following method was practiced in NECL for extraction of steep thick seam?

a) blasting gallery
b) sublevel caving
c) bhaska and tipong
d) long wall

194. Two coal seams are called contiguous if they are A m (maximum) apart from each other. A is given by

a) 3 m b) 6 m
c) 9 m d) no specific distance

195. The parting left between any two seams or sections lying within 9m of each other shall not be less than Am thickness at any place. A is given by

a) 0.5 m b) 1 m
c) 2 m d) 3 m

196. Extraction to a small sized, irregular and unsystematic underground working is called

a) sublevel stoping
b) gophering
c) room and pillar mining
d) sublevel stoping

197. In underground, from the footwall shaft cross-cuts are drawn to intersect the orebody and raises are made to connect the cross-cuts. The top of the raises are widened. Name the method of extraction.

a) open underhanding stoping
b) open overhand stoping
c) underground glory hole or milling
d) breast stoping

198. This method is used for mining narrow veins or pay streaks, where the ore occurs as a distinct band and can be separated easily from the wall rocks. The method of mining is known as

a) room and pillar mining
b) widestall method
c) resuing or stripping
d) integral caving

199. It's a coal mining extraction method where simultaneous development and extraction is done and parallel faces are separated by a series of fender block of coal. The mining is known as

a) widestall method
b) wongawilli
c) room and pillar
d) bord and pillar

200. What is the name of the media through which coal pulp in hydraulic mining is sent from face to pulp sump or coal crusher?

a) pipe
b) conduit
c) flumes
d) wagon

201. What should be the minimum pressure to be maintained at the nozzle in hydraulic mining operation?

a) 5 – 10 kgf/cm^2
b) 10 – 20 kgf/cm^2
c) 21 – 35 kgf/cm^2
d) 40 – 100 kgf/cm^2

202. Which of the following statutory provision restrict the propagation of hazards from one development district to other part of the bord and pillar mine?

a) ventilation stopping
b) air-crossing
c) panel system of working
d) explosion-proof stoping

203. The process of extraction of soluble metal compounds by reaction with acid or basic solvents or water is called

a) hydraulicking
b) leaching
c) dredging
d) placer mining

204. It is the part of cost of the fixed asset to the owner which is treated as loss in value of capital?

a) fixed capital
b) depreciation
c) liability
d) depletion allowance

205. The ratio of current assets to current liability is known as

a) quick ratio
b) assessment ratio
c) liquidity
d) profit ratio

206. Which of the following is called ROI?

a) $\frac{\text{profit} \times 100}{\text{capital employed}}$

b) $\frac{\text{profit} \times 100}{\text{sales}}$

c) $\frac{\text{sales} \times 100}{\text{profit}}$

d) capital turn over rate

207. Which of the following is in vogue to calculating depreciation?

a) budgeting control method
b) straight-line method
c) industries sickness control method
d) cost control technique

208. In sampling, a part is collected to represent the total set of observation. Use any single word from the following to replace "total set of observation"

a) variance
b) distribution
c) population
d) deposition

209. Which of the following sampling technique is followed during sampling from wagons or dumps in the form of scoop taken at regular intervals?

a) chip sampling
b) borehole sampling
c) bulk sampling
d) grab sampling

210. When the occurrence of mineral (e.g. rare minerals) is randomly distributed in a rock then which of the distribution pattern is statistically followed?

a) normal distribution
b) skewed distribution
c) lognormal distribution
d) poisson distribution

211. A sample of 144 items gives a mean value of 45, with a standard deviation of 3. Calculate symmetric confidence limits within which the true population lies with 95% confidence?

a) 41.5 and 42.5
b) 42.5 and 43.5
c) 43.0 and 43.5
d) 44.5 and 45.5

212. Which of the following statement is true for long wall mining?

a) maximum tensile stress remains at the edge of gob
b) maximum tensile stress remains at the centre of gob
c) maximum tensile stress will shift from edge to centre of the gob
d) maximum tensile stress shall remain away from the chain pillar

213. When the Young's Modulus is small, failure of immediate roof will initiate from?

a) at the gob edges near the chain pillar
b) at the centre of chain pillar
c) at the centre of the gob
d) just above the corner powered support of the set of powered support

214. When does the first caving in long-wall working starts?

a) it usually starts when the tensile stress in a certain point of the roof over the gob exceeds its tensile strength
b) it starts when rocks over the gob area are in compression
c) it starts when the thickness of immediate roof increases
d) it usually starts when the tensile stress remains less or equal to the tensile strength

215. When the thickness of immediate roof is more than A m then it becomes stronger and behaves like a main roof? A is given by

a) 1 m
b) 2 m
c) 4 m
d) 6 m

216. What will be relation between the side abutment pressure and Young's Modulus of the main roof after weighting?

a) directly proportional
b) inversely proportional
c) equal
d) no relation exist

217. Which of the following actually determines the periodic weighting length in longwall working?

a) thickness of immediate roof
b) physical properties of main roof
c) the stratigraphic sequence
c) compressive strength of immediate roof

218. Which of the following controls the magnitude and direction of the front abutment pressure for immediate roof in long wall working?

a) Young's Modulus
b) stratigraphic sequence
c) periodic caving
d) strong main roof

Answers

1. b	2. c	3. a	**4. b**	5. d	6. b	7. a	8. b
9. a	10. c	11. d	**12. b**	13. c	14. a	15. b	16. a
17. c	18. b	19. b	**20. c**	21. c	22. c	23. c	24. c
25. c	26. b	27. c	**28. c**	29. b	30. a	31. c	32. b
33. a	34. b	35. a	**36. d**	37. a	38. b	39. c	40. a
41. b	42. a	43. a	**44. b**	45. c	46. a	47. c	48. d
49. d	50. a	51. c	**52. c**	53. b	54. d	55. b	56. c
57. b	58. b	59. b	**60. c**	61. a	62. c	63. a	64. d
65. b	66. d	67. b	**68. d**	69. c	70. a	71. b	72. a
73. b	74. a	75. c	**76. d**	77. b	78. a	79. b	80. a
81. b	82. c	83. b	**84. b**	85. a	86. b	87. c	88. c
89. a	90. c	91. d	**92. a**	93. d	94. a	95. b	96. b
97. a	98. b	99. c	**100. b**	101. d	102. a	103. b	104. a
105. c	106. d	107. d	**108. d**	109. d	110. b	111. b	112. a
113. d	114. a	115. b	**116. d**	117. c	118. c	119. b	120. c
121. b	122. a	123. d	**124. b**	125. d	126. b	127. a	128. c
129. b	130. d	131. a	**132. a**	133. a	134. b	135. c	136. a

137. a	138. b	139. d	140. a	141. c	142. c	143. d	144. d
145. d	146. b	147. d	148. b	149. b	150. c	151. b	152. d
153. d	154. d	155. c	156. c	157. c	158. d	159. b	160. c
161. d	162. c	163. c	164. a	165. a	166. b	167. b	168. d
169. c	170. b	171. a	172. c	173. c	174. c	175. a	176. b
177. d	178. d	179. b	180. c	181. b	182. b	183. b	184. b
185. d	186. b	187. d	188. c	189. d	190. d	191. b	192. c
193. c	194. c	195. d	196. b	197. c	198. c	199. b	200. c
201. d	202. c	203. b	204. b	205. c	206. a	207. b	208. c
209. d	210. d	211. d	212. b	213. c	214. a	215. d	216. b
217. b	218. a						

CHAPTER - 2

MINE ENVIRONMENT

1. Which diagram explains the Limits of explosibility of CH_4 ?

a) Coward
b) Le chetelier
c) Grahams
d) Palvalov

2. The limit of explosibility of a mixture of combustible gases can be computed by which of the following equation?

a) Pythagorus equation
b) Le chetelier equation
c) Simon's equation
d) Solmon's equation

3. What is the minimum percentage of O_2 to make the methane air mixture explosive?

a) 8%
b) 10%
c) 12%
d) 15%

4. What should be the range of methane air mixture to make it an explosive?

a) 4.2 – 8.4
b) 5.4 – 14.8
c) 7.4 – 16.6
d) 10 – 18

5. The delay between the ignition and the application of the heat source termed as

a) lag on ignition
b) incubation period
c) saturation period
d) thermal conductivity

6. The rate of increase of temperature with depth is called

a) geothermal gradient
b) endothermic gradient
c) exothermic gradient
d) scale

7. Which of the following property is not a complex function of Thermal emmisivity?

a) moisture content
b) temperature
c) rock surface
d) rock weatherability

8. Men through the process of 'A' produce heat. A is given by

a) metabolism
b) acclimatization
c) salt depletion
d) dehydration

9. The instrument used for measuring humidity is called

a) hygrometer
b) methanometer
c) galvanometer
d) thermometer

10. Noise in fans is a function of A. Where A is given by

a) rotational speed
b) fan blade number
c) quality of air velocity
d) fan stator

11. Gas chromatography separates & analyze components of gas mixture by

a) adsorbent
b) molecular species
c) boiling water
d) catalyst

12. What does the CH_4 produce when burns in air?

a) $CO + CO_2$
b) $CO_2 + H_2O$
c) $CH_4 + H_2O$
d) $CO + CH_4$

13. Name the instrument, which is used to measure the atmospheric pressure?

a) barometer
b) hygrometer
c) kata thermometer
d) methanometer

14. What is the use of Pitot tube?

a) to measure static pressure
b) to measure sound wave
c) to measure air velocity
d) to measure air temperature

15. The temperatures in upcast shaft & downcast shaft are 40°C & 30°C respectively. Shaft is 350 m deep. Find the height of motive column?

a) 9 b) 11
c) 13 d) 15

16. If the height of motive column is 12 m & density of air in DC shaft 1.2 Kg/m^3, find out the NVP

a) 10 b) 10.8
c) 13.2 d) 14.4

17. The relation between Pressure (P), Quantity (Q) & resistance of airway (R) is expressed like

a) $P = R / Q^2$
b) $R = Q^2 / P$
c) $PRQ = 1$
d) $P = RQ^2$

18. What is the water gauge required to pass 2000 m^3 air per min through an airway of 3m x 4.2 m cross section and 1.8 Km long? Coefficients of friction of airway is 0.001 kilomurg

a) 14.4 b) 16.4
c) 18.4 d) 20.4

19. Calculate the w.g produced by a 3.2 m diameter fan running at 280 rpm and delivering 7500 m^3/ min of air, if the blades are radial, assume air density = 1.2 Kg/m^3

a) 240 b) 270
c) 300 d) 330

20. CO_2 is treated as best extinguisher for

a) class A fire
b) class B fire
c) class C fire
d) all fires

21. Foam type extinguisher is not permitted to dealing with class 'C' fires because

a) foam is inflammable
b) foam produces toxic chemicals

c) foam is conductor of electricity
d) all of above

22. If fire takes place in the DC shaft or in the vicinity of main intake airway, reversal of ventilation is advantageous and this is because

a) it prevents the smoke and fumes from reaching the working faces
b) it results in opening the separation doors between DC & UC shafts
c) it may cause movement of large volume of gas from goaves & old workings to main intake airways
d) all of the above

23. What type of measurement is done with velometer?

a) pressure drop between any point intake airways
b) air velocity
c) mine air resistance
d) air temperature

24. Which of the following is not the criteria that should be considered to decide the places where air velocity in underground mines to be measured?

a) Roadways should have uniform cross section & preferably straight
b) The cross section of roadways should be such that the area can be easily calculated
c) Resistance of the roadway must be fairy high
d) Roadway should be away from bends, junction & free from obstructions

25. How the anemometer is used to determine the average velocity of air

a) Anemometer should be moved throughout the cross section of the roadway
b) It is kept at the roof of the gallery
c) It is laid at the floor of the roadway
d) It is moved along a straight line

26. When a fluid flows through a passage of varying section the total energy of the moving stream remains constant, assuming no friction losses. This can be explained by

a) Kirchoff's Law
b) Bernonilli's Theorem
c) Graham's Law of diffusion
d) Charles Law

27. The volume of a given mass of gas varies inversely as the absolute pressure if the temperature remains constant. This is explained by

a) Charles Law
b) Kirchoff's Law

c) Boyle's Law
d) Graham's Law

28. How many Kcal of heat is produced when 1 Kg of CH_4 is burnt?

a) 580 Kcal
b) 1500 Kcal
c) 8800 Kcal
d) 13600 Kcal

29. Methane drainage was first tried in a colliery?

a) Ruhr Coalfield of Germany
b) Amlabed Colliery of India
c) Santa Lucia mine of Spain
d) Lorraine Coal field of France

30. Find the percentage of blackdamp from the mine air sample (pressure by volume) shown below: O2 = 19.11; N2 = 79.04; CO_2 = 0.25; CO = 0.02; CH_4 =1.58

a) 6.1
b) 7.1
c) 8.1
d) 9.1

31. The evasee chimney of a fan has an area of $4m^2$ at the base and 14 m^2 at the outlet. Calculate the saving of w.g due to evasee when the output of a fan is 6000 m^3/min

a) 25 mm of w.g
b) 35 mm of w.g
c) 45 mm of w.g
d) 55 mm of w.g

32. A district of an underground mine is ventilated by 40 m^3/s. Water gauge across the district is 30mm. If the quantity has to be reduced to 25 m^3/s by installing a regulator in the return of the district, calculate the size of the regulator.

a) 2.22 m^2
b) 3.33 m^2
c) 4.44 m^2
d) 5.1 m^2

33. Four underground roadways in parallel spread from a point near the bottom of a DC shaft & join at a point near the bottom of UG shaft. The parallel roadways have resistances of 9,16,25,36 Kilomurg respectively. The resistance of the fan drift is 1.5 Kilomurg, whereas for DC shaft &UC shaft it is 2 & 2.5 Kilomurg respectively. Calculate the combined resistance of the whole mine

a) 6.1 Kilomurg
b) 7.1 Kilomurg
c) 8.1 Kilomurg
d) 9.1 Kilomurg

34. The quantity of air going down the DC district is 850 m^3/min. The surface ventilator develops water gauge of 45 mm when the ventilator is stopped the air going down the shaft is 280 m^3/min. What is the NVP?

a) 5.5 mm of w.g
b) 6.5 mm of w.g
c) 7.5 mm of w.g
d) 10 mm of w.g

35. What are the composition of the solution in which the plates of the Oldham cap lamp battery remain immersed?

a) HNO_3 + HCL
b) HCL + H_2O
c) H_2SO4 + distilled water
d) Lead solution

36. Why auxiliary fan of forcing type is located in the airway at least 9m up stream of the corner of pillar at the junction of the heading to be ventilated?

a) To allow minimum deposition of dust
b) To avoid recirculation of hot return air mixed with dust & gases
c) To avoid chances of any explosion
d) To avoid mixing of intake and return air

37. Why more than one auxiliary fan is not used in one ventilating district?

a) It recirculates air containing dust & noxious gases
b) Deposits of dust on the fan moving pasts
c) Chances of electrostatic sparking
d) It affects the air quality being circulated

38. What should be the minimum quantity of air to be circulated along a longwall face at its maximum span of 6m for a 2.5m thick gassy seam of 2nd degree?

a) 650 m^3/min
b) 750 m^3/min
c) 900 m^3/min
d) 1200 m^3/min

39. What minimum quantity of air required to be circulated along the last ventilation connection in the gassy seam 2nd degree having ventilating connection (4.2mx3m) in a district where 120 persons are employed on the largest shift and producing 360 tonnes of coal per day?

a) 800 m^3/min
b) 900 m^3/min
c) 1000 m^3/min
d) 1200 m^3/min

40. What should be minimum quantity of air to be circulated along a long wall face at its maximum speed of 7.5 m for a 3 m thick gassy seam of 3rd degree?

a) 989.5 m^3/min
b) 1447.5 m^3/min
c) 1687.5 m^3/min
d) 2022 m^3/min

41. Auxiliary fan means a forcing fan used below ground mainly for ventilating

a) Whole current of air passing along intake or return airways of a mine
b) A ventilating district

c) One or more faces forming a part of ventilating district
d) None of the above

42. Booster fan means a mechanical ventilator used below ground for

a) Ventilating one or more faces in the part of a district
b) Boosting whole current of air passing along intake or return airway of a mine or ventilating district
c) Both of the above
d) None of the above

43. Black damp contains varying proportion of

a) CO_2 + CO
b) CO_2 + H_2
c) CO_2 + N_2
d) CO_2 + CH_4

44. Firedamp is largely made up of

a) CO_2
b) CO
c) CH_4
d) N_2

45. Stink damp is synonymous with

a) H_2S
b) CH_4
c) NO_2
d) SO_2

46. Which of the following gas is not considered as chief harmful gas?

a) CH_4
b) CO
c) CO_2
d) SO_2

47. In a depleting percentage of oxygen, persons suffer in different degree. At what percentage person will face instant loss of sense?

a) 15
b) 12
c) 10
d) 7

48. Which of the following gas is introduced in a goaf to combat or as a measure against fire or spontaneous heating?

a) SO_2
b) H_2
c) CO_2
d) N_2

49. At what percentage of CO_2 safety lamp begins to die down?
    a) 3 b) 1
    c) 0.5 d) 0.1

50. In blasting operation, generally 1 Kg of explosive liberates how much liter of CO at STP?
    a) 10 b) 15
    c) 20 d) 40

51. The internal combustion engine of a diesel loco produces exhaust gas of varied concentration. What is the concentration level of CO in the exhaust gas?
    a) 10 – 20 ppm b) 50 – 60 ppm
    c) 100 – 200 ppm d) 201 – 400 ppm

52. How much CO will be produced if 1 Kg of coal dust (75% carbon) is burnt in favourable conditions?
    a) 0.5 cum b) 0.75 cum
    c) 1.0 cum d) 1.5 cum

53. Which of the following activity will not support formation of H_2S inside the mine?
    a) decay of timber
    b) spontaneous combustion of coal
    c) spreading of coal dust
    d) burning of blasting fuse

54. Which of the following percentage of methane is not explosive?
    a) upto 5 b) 5.1 – 8
    c) 8.1 – 12 d) 12.1 – 15

55. What is the mass of 1 m^3 CH_4 at NTP?
    a) 0.316 Kg b) 0.416 Kg
    c) 0.616 Kg d) 0.716 Kg

56. Burning of Methane with a blue flame producing A & B gas. A and B are given by
    a) CO_2 + CO
    b) CO_2 + H_2O
    c) CO_2 + N_2
    d) CO_2 + CH_4

57. The lag on ignition in terms of ignition of CH_4 is because of the following fact
    a) It takes the time of absorption of N_2
    b) It takes the time of absorption of N_2

    c) It stars dissociating and burns only after absorbing a certain quantity of heat
    d) It depends on its maximum saturation

58. Firedamp or methane is generally found in
    a) metal mines
    b) coal mines or tunnel passing through carbonaceous shale
    c) in pond
    d) in general atmosphere

59. Which of the following empirical relation exists between depth of hole (h) and the gas content (v), A and B are constants?
    a) v = Ax Bx h b) $v = \frac{AB}{h}$
    c) $v = \frac{Ah}{1+Bh}$ d) $v = \frac{Bh}{1+Ah}$

60. What is the relation between size of coal and total methane gas content emitted at face?
    a) directly proportional
    b) inversely proportional
    c) in GP series
    d) in AP series

61. The rate of methane gas emission can be expressed as a function of
    a) coal permeability
    b) depth
    c) width of working
    d) method of working

62. Samples of air collected in the intake and return gates of an advancing longwall face show 0.3 and 0.9% methane respectively. Calculate the methane emission per tonne of coal mined if production from the face averages 800t per day and air quantity of 24 m^3 per sec circulates along the face?
    a) 5.5 m^3 b) 10.5 m^3
    c) 15.5 m^3 d) 20.5 m^3

63. Which of the following empirical relation is used to find out the methane layering number in terms of air velocity (v), width of airway (w), quantity of methane (q) emitted in air?
    a) $\frac{v}{(4.32\,q/w)^{1/3}}$ b) $\frac{q}{4.32\,(v/w)^{1/3}}$
    c) $\frac{w}{4.32\,(q/v)^{1/3}}$ d) $\frac{(4.32\,q/w)^{1/3}}{v}$

64. Which of the following means is adopted to break the methane layering?

a) increased air velocity
b) methane probe
c) venturi blower
d) water spraying

65. As per Indian law the methane concentration should not exceed "A%" in any part of the mine. A is given by

a) 0.5% b) 0.75%
c) 1% d) 1.25%

66. As per Indian law the methane concentration should not exceed "A%" in the return of a ventilation district. A is given by

a) 0.25% b) 0.45%
c) 0.75% d) 1.25%

67. Flame safety lamp is used for testing

a) CO
b) CO_2
c) CH_4
d) H_2S

68. In usual testing by flame safety lamp, the percentage of gas present in underground mine air is indicated by

a) colour of wick
b) light emitted by the lamp
c) height of cap
d) nature of fuel used in the lamp

69. A normal flame safety lamp can measure CH_4 concentration upto a minimum percentage A. Where A is given by

a) 0.5% b) 1%
c) 1.5% d) 3%

70. Which of the following test is better to carry out before cap test?

a) ignition test
b) accumulation test
c) loop test
d) sensitivity test

71. Noncollagenous pneumoconiosis is caused by

a) fibrogenic dust
b) non fibrogenic dust
c) silica dust
d) barium sulphate

72. In order to suppress dust to be air-borne, apart from water what else is sprayed or mixed with it?

a) aluminum dust
b) boric powder
c) common salt
d) soda powder

73. Dust suppression by water has one of the following disadvantages?

a) causes the belt to slip
b) worker take rest during this period
c) blasting efficiency becomes poor
d) increases humidity in the mine

74. Which type of machine is used to clean the dust-laden air?

a) jig machine
b) vortex cleaner
c) cyclone separator
d) electrostatic diffusion

75. What do you mean by gauge pressure?

a) difference between absolute pressure and atmospheric pressure
b) static pressure plus velocity pressure
c) barometric pressure
d) absolute pressure only

76. Sum of static pressure and velocity pressure is known as

a) atmospheric pressure
b) absolute pressure
c) gauge pressure
d) total pressure

77. The pressure inside a sealed vessel shown by a manometer is called

a) velocity pressure
b) static pressure
c) barometric pressure
d) mean atmospheric pressure

78. Creep is the error associated with

a) fortin barometer
b) manometer
c) aneroid barometer
d) mercury barometer

79. Can you guess on the geothermic gradient for Indian coalfields?

a) 1K / 11 m b) 1K / 18 m
c) 1K / 28.4 m d) 1K / 38.4 m

80. During hard work e.g. shoveling, tramming, the metabolic heat rate (W m^{-2}) from the body surface of an average person is in the range of

a) 90 **b)** 150
c) 200 **d)** 270

81. The frictional heat produced by the haulage in the mine can be diverted by

a) a forcing fan
b) an exhaust fan
c) installing haulages in return
d) reducing the speed

82. Major source of heat in underground coal mines is

a) from lights
b) from men
c) due to oxidation
d) from machinery

83. The fall of 0.1 % of O_2 in the air between intake and return airways produces enough heat to raise air temperature by

a) 1 K **b)** 7 K
c) 15 K **d)** 30 K

84. What is the range of heat produced due to oxidation of coal?

a) 1.7 MJ m^{-3} **b)** 3.79 MJ m^{-3}
c) 5.79 MJ m^{-3} **d)** 8.79 MJ m^{-3}

85. A fan ventilating a heading through a duct of 750mm diameter circulates 5m^3 s^{-1} of air at the face. Calculate the heat added to the air by the fan, if the input power of the fan is equal to 3kW.

a) 1667 J **b)** 2617 J
c) 2917 J **d)** 3317 J

86. Hygrometric survey is carried out to check and control environmental conditions in mines. This is done by

a) whirling hygrometer
b) assman psychometer
c) fixed hygrometer
d) manometer

87. What do you mean by specific heat of air?

a) Amount of heat required to raise the temperature of a unit mass of air by one Kelvin
b) Amount of air required to lower the temperature of a unit mass of air by one Kelvin

c) Amount of heat required to raise the temperature of a unit volume of air
d) Amount of heat required to raise the temperature of a mixture of gases

88. Enthalpy of air at 273.15 K (0°C) is assumed to be

a) 0 b) 1
c) 2 d) 3

89. Under hot and humid conditions, more blood is supplied to the skin and cardiac output increases which may results into

a) high blood pressure
b) high blood circulation
c) cardiac failure
d) skin becomes hot

90. A miner when doing hard work at 307 K may sweat at the rate of

a) 120 cm^3 per hr b) 350 cm^3 per hr
c) 550 cm^3 per hr d) 850 cm^3 per hr

91. What is the loss of sodium chloride in 100 cm^3 of sweats?

a) 0.1 g b) 0.5 g
c) 1 g d) 5 g

92. It gives the assessment of cooling power of the environment irrespective of the working rate of men. This is known as

a) kata estimation
b) effective temperature
c) dry bulb temperature
d) sweat rate

93. The maximum rate of heat transfer from 1m^2 of the human body surface to the surrounding air under any environmental condition is called

a) specific heat of air
b) specific cooling power
c) predicted sweat rate
d) metabolic rate

94. In a mine airway of 2.25 × 1.6 m size, the velocity of air is 0.8 m/sec. Calculate the maximum velocity at which the flow still remains truly laminar. Kinematic viscosity is 0.16 × 10^{-4} m^2 s^{-1}

a) 0.015 m s^{-1} b) 0.016 m s^{-1}
c) 0.017 m s^{-1} d) 0.02 m s^{-1}

95. The nature of flow of a fluid is governed by a dimensionless parameter called

a) boundary later
b) reynolds number
c) resistance co-efficients
d) turbulent fluid

96. What is the nature of flow of air in mines?

a) laminar
b) turbulent
c) circular
d) smooth conduits

97. What is the pressure required to circulate 18m^3 of air per second, through an underground coal mine airway 260m long, 3m high and 2.5m wide? The co-efficient of friction of the airway is 0.01 N s^2 m^{-4}.

a) 25.7 Pa
b) 35.7 Pa
c) 45.7 Pa
d) 55.7 Pa

98. A smooth steel duct 450 × 600 mm in size circulates 0.5 m^3 of air per second. Calculate the coefficient of resistance of the duct?

a) 0.01
b) 0.015
c) 0.02
d) 0.04

99. Calculate the pressure required to circulate 2400 m^3 per minute of air through a 3km long tunnel of 3 × 2.5 m cross section with k = 0.001 N s^2 m^{-4}

a) 125 Pa
b) 225 Pa
c) 300 Pa
d) 375 Pa

100. A mine airway 2m wide, 2.5m high and 500 m long. The airway passes a quantity of 8 m^3 per second. Calculate its pressure loss? Assume k = 0.0098 N s^2 m^{-4}

a) 11 Pa
b) 21 Pa
c) 31 Pa
d) 50 Pa

101. What do you mean by power of ventilation?

a) leakage of ventilation path
b) Air flow through a duct of varying cross-section
c) Size of regulators
d) rate at which work is done to maintain the air flow through a system

102. By reducing the resistance of an airway, besides improving the ventilation efficiency what else of the following can be achieved?

a) interest charges on the capital cost
b) increasing the total quantity of air entering the mine
c) reduction of power cost of ventilation
d) minimization of leakages

103. A district is supplied by a main intake and a main return airway running side by side at a distance of 30m and interconnected at 50m intervals. The stoppings in the interconnections allows some leakages so that the quantities measured at inbye and outbye ends of the main intake are 5 and 7.5 m^3 s^{-1} respectively. Calculate the pressure across the main intake and return at the outbye end if the resistances of the main intake, main return and working district are 7.5, 7 and 0.5 N s^2 m^{-8} respectively.

a) 556 Pa
b) 565 Pa
c) 456 Pa
d) 465 Pa

104. A 5m long duct of 500mm diameter is closed at both ends and pressurized by compressed-air to a gauge pressure of 500 Pa. The pressure fell to 250 Pa after 20 seconds. Calculate the rate of leakage while barometric pressure is 101 kPa.

a) 0.0001 m^3 s^{-1}
b) 0.00015 m^3 s^{-1}
c) 0 .0002 m^3 s^{-1}
d) 0 .00025 m^3 s^{-1}

105. Natural ventilation can be caused by

a) Auto-compression in downcast shaft
b) differences in air densities in upcast and downcast shafts
c) auto-expansion in upcast shaft
d) moisture content in the mine

106. If the mean barometric pressure of the downcast air column is higher than that of the upcast air column then what will happen?

a) there is no flow of air in the mine
b) maximum leakage of air in the district
c) it will help natural ventilation
d) it will create differences in air densities

107. How can emission of methane help the underground mine environment?

a) increasing the total volume of air in the mine
b) reducing the percentage of toxic gases in the mine atmosphere
c) aiding to natural ventilation by reducing the density of return air
d) increasing the percentage of oxygen in the district

108. How does the circulation of refrigerated air through the downcast shaft aiding the natural ventilation?

a) increasing the density in upcast shaft
b) reducing the density in upcast shaft
c) increasing the density in downcast shaft
d) reducing the density in downcast shaft

109. Which one of the following factor does not have any control over the circulation by natural ventilation?

a) barometric pressure
b) emission of methane
c) circulation of refrigerated air
d) specific heat of air

110. When the effect of surface temperature on natural ventilation will be less or negligible?

a) in shallow mines
b) in deeper mines
c) when fan size is inadequate
d) when the mine size is extensive

111. When there is a chance of reversal of air-current of natural ventilation?

a) in shallow mines during summer to winter
b) in deeper mines during summer
c) in shallow mines during spring
d) in deeper mines during autumn

112. Calculate the natural ventilating pressure in a mine from the following data

Depth of the mine = 400 m
Pit-bottom barometer reading = 101 kPa
Pit-top barometer reading = 99.5 kPa
Average temperature in DC shaft = 305 K
Average temperature in UC shaft = 308 K

a) 13.7 Pa b) 23.7 Pa
c) 43.7 Pa d) 55 Pa

113. The following are the readings of the fan drift pressures and quantities with the fan running at two different speeds. Calculate the NVP (Pa) and find the equivalent orifice (m^2) of the mine?

Fan drift pressure at a speed of 29 rad s^{-1} = 600 Pa
Fan drift quantity at a speed of 29 rad s^{-1} = 80 m^3 s^{-1}

Fan drift pressure at a speed of 32 rad s^{-1} = 680 Pa
Fan drift quantity at a speed of 32 rad s^{-1} = 84 m^3 s^{-1}

a) 170.5, 3.29 b) 180.5, 3.69
c) 190.5, 3.87 d) 200.5, 3.97

114. What is the characteristic of velocities considered in Euler's equation?

a) it is the average velocity over the cross-section perpendicular to the direction of flow
b) it is the true velocities over the air shaft
c) it is the head developed by the centrifugal fan
d) it is due to the torque generated by the fan itself

115. What do you mean by vane efficiency?

a) the ratio of actual head to the theoretical head
b) the ratio of the input head to Euler's head
c) the ratio of total head to input head
d) the ratio of total head developed to the velocity head

116. What do you mean by mechanical efficiency of a fan?

a) the ratio of the power actually absorbed by the impeller and converted into head to the power applied to the shaft
b) the ratio of the power in the air to the input power
c) the ratio of input head to Euler's head
d) the ratio of total head developed to the velocity head

117. Which of the following is the most important fan characteristics in order to decide its applicability to a particular mine?

a) efficiency-capacity fan characteristics
b) power-capacity fan characteristics
c) head-capacity fan characteristics
d) mechanical losses-hydraulic losses characteristics

118. Eddy losses for fan is significant when

a) fan runs at its full capacity
b) fan operates at low volumes
c) the fan drift cross-section is very high
d) the fan drift cross-section is very less

119. Apart from skin friction and diffusion losses in the impeller, there is other losses happened to be at the impeller inlet and outlet which altogether adds to the hydraulic losses. What is that losses?

a) eddy and separation losses
b) losses due to leakages
c) mechanical losses
d) hydraulic losses minus friction loss in the channel

120. What do you mean by head co-efficient?

a) It is the ratio of the head at the operating point to Euler's head at zero capacity
b) It is the ratio of the square of the impeller speed to power input
c) it is the ration of the head developed to the square of the speed
d) it is the ratio of the speed to the Euler's head at maximum efficiency

121. What do you mean by specific capacity in relation to a fan?

a) it is the dimensionless characteristic describing the performance of an impeller
b) this is an important design factor used as type number for grouping impellers hydraulically
c) it is the dimensionless design constant used to form a continuous function of specific speed of fan
d) it is the ratio used to determine the design of the volute casing

122. What should be maximum allowable gap between the impeller and the impeller inlet for fans about 760 mm size (back ward bladed)?

a) 1 mm
b) 3 mm
c) 6 mm
d) 10 mm

123. What do you recommend to minimizing the leakage loss and bettering efficiency in the design of impeller of fan of low specific speed?

a) As little gap to be maintained between the side of the stationary casing and the rotating impeller as possible
b) providing maximum clearance between the inlet and the wheel
c) the clearance between the tip of the cut-off sheet and the fan wheel should not be more than 3% of the wheel diameter
d) the tip of the cut-off sheet is usually rounded or blunted

124. What do you mean by angle of attack?

a) it is the angle between the drag component and lift component of the force acting on an aerofoil
b) the angle between the chord of the aerofoil and the direction of the average relative velocity of air
c) the angle between the undisturbed actual air velocity and width of aerofoil
d) it is the maximum distance between mean line to chord of aerofoil

125. The curvature of diffuser vane shall be so fixed that the fluid enters the guide passage with minimum loss. This is possible only when

a) the guide vane inlet angle is always less than Ð / 2 rad
b) the diffuser vane entrances angles are laid at same radii for a constant pitch

c) the outlet velocity angle has tangential component only
d) angle between guide vane inlet and the direction of the absolute velocity of air leaving the impeller is small or equal to zero

126. Why forcing ventilation is undesirable in a continuous miner face?

a) It is very costly
b) it occupies whole cross-section of the heading
c) it exposes workers to high concentrations of dust
d) It is unable to cope up with the rate of advance of continuous miner

127. Which of the following ventilation system is adopted for continuous miner headings?

a) duct less auxiliary ventilation
b) overlap system of ventilation
c) exhaust type of ventilation without ducting
d) forcing type of ventilation

128. How can you reduce the resistance developed in a ventilation duct?

a) by using a duct of very high length
b) by using a duct having corrugated internal surface
c) using a large-diameter duct
d) increasing the flow of air through the duct

129. As per the national coal board, UK recommendation, what should be the diameter of duct to be used for a distance beyond 900m?

a) 250 mm
b) 400 mm
c) 500 mm
d) more than 600 mm

130. The primary aim of ventilation control in the event of fires is

a) to help fire fighters and rescuers as far as practicable
b) to keep continuing the production work in the district
c) arranging fire doors to control fire
d) to withdraw workers from the mine as early as possible

131. Ventilation survey usually means

a) quantity survey of air in the mine
b) quality survey in the mine
c) both quantity and pressure survey in the mine
d) pressure survey in the mine

132. Which of the following method is used for calculating velocity of air in underground?

a) smoke-cloud method
b) pulsed infusion method
c) optical method
d) inertial precipitation method

133. A standard pitot-static tube placed at the centre of 500 mm diameter circular duct records a velocity pressure of 300 Pa. Calculate the quantity of air flowing in the duct if the air temperature 301 K and density of air 1.2 kg m^{-3}. Assume the air to be dry and the method factor is 0.8

a) 3 m^3 / s
b) 3.5 m^3 / s
c) 4 m^3 / s
d) 4.5 m^3 / s

134. This is a highly accurate and time consuming method of measuring air velocity by anemometers and generally confined to measuring in major airways only

a) continuous traversing
b) precise traversing
c) single point measurement
d) measurement at the centre of the location

135. The method factor for anemometer reading in duct varies with the

a) roughness of the sides of the airway and the reynold's number
b) length of the duct
c) velocity of air flowing through the duct
d) quantity of air flowing through the duct

Answers

1. a	2. b	3. c	4. b	5. a	6. a	7. d	8. a
9. a	10. d	11. b	12. b	13. a	14. a	15. b	16. d
17. d	18. a	19. b	20. c	21. c	22. a	23. b	24. c
25. a	26. b	27. c	28. d	29. a	30. b	31. b	32. a
33. b	34. a	35. c	36. b	37. a	38. c	39. b	40. c
41. c	42. b	43. c	44. c	45. a	46. d	47. d	48. d
49. a	50. d	51. d	52. d	53. c	54. a	55. d	56. b
57. c	58. b	59. c	60. b	61. b	62. c	63. a	64. c
65. d	66. c	67. c	68. c	69. c	70. b	71. b	72. c
73. d	74. c	75. a	76. d	77. b	78. c	79. d	80. d
81. c	82. c	83. b	84. d	85. b	86. a	87. a	88. a
89. c	90. d	91. b	92. b	93. b	94. c	95. b	96. b
97. d	98. c	99. a	100. c	101. d	102. c	103. a	104. a
105. b	106. c	107. c	108. c	109. d	110. b	111. a	112. c
113. b	114. a	115. b	116. a	117. c	118. b	119. a	120. a
121. a	122. b	123. a	124. b	125. d	126. c	127. b	128. c
129. d	130. d	131. c	132. a	133. b	134. b	135. a	

CHAPTER - 3

MINING MACHINERY

1. The coefficient of static friction between wheels & rail for locomotive is usually

a) 0.2
b) 0.4
c) 0.6
d) 0.8

2. Flame trap or flame arrestor is used with

a) conveyor
b) direct haulage
c) diesel locomotive
d) shaker conveyor

3. Jigging or reciprocating movement is associated with

a) shaker conveyor
b) belt conveyor
c) diesel locomotive
d) cable belt conveyor

4. Exhaust conditioner is used with

a) diesel locomotive
b) battery locomotive
c) overhead locomotive
d) compressed locomotive

5. The exhaust of Diesel loco is mixed with fresh air before being discharged into open atmosphere of mine. The minimum quantity of fresh air mixed with the exhaust is A times of volume of exhaust. 'A' is given by

a) 5
b) 10
c) 20
d) 40

6. The flame trap of diesel locomotive is liable to choke up due to

a) dust in air
b) impure engine oil
c) narrow aperture of plates
d) poor filter

7. Which of the following can be used safely right upto the face of coal mine?
a) battery loco
b) diesel loco
c) trolley wire loco
d) all of these

8. Charging of battery of battery loco gives off
a) H_2
b) CH_4
c) H_2S
d) NO_2

9. Which of the following reason restrict the use of loco in underground coal mine?
a) Cost
b) Ventilation
c) Safety
d) output

10. Slip ring motor with controller is used with
a) direct rope haulage
b) belt conveyor
c) jigging plant
d) tail rope haulage

11. An attachment used with the last tub of the set of ascending tubs, is known as
a) automatic catch
b) backstay
c) buffer
d) stopblock

12. On a curve, which of the following force creates tendency for the train to leave the track causing excessive wear on the wheels?
a) centripetal force
b) centrifugal force
c) frictional force
d) gravitational force

13. 135 ton of coal is to be hauled by direct rope haulage in a shift of 6 hours hauling time where the length of haul is 1100m. The average speed of rope is 6 Kmph. Set changing time is 1 min & tub capacity is 1.5 ton. Calculate the number of tubs per set?
a) 6 b) 9
c) 12 d) 15

14. If the track gauge of underground haulage is 0.6 m, radius of curve 2 m, velocities of train 2 m/sec, then find out the amount of super elevation.
a) 0.02 b) 0.12
c) 0.22 d) 0.32

15. The approximate length of conveyor of loop-take-up portion of a B/ Conveyor is A% of the total conveyor length. A is given by,
a) 0.5% b) 1%
c) 2% d) 4%

16. Reciprocating or Jigging movements is known as
a) slow forward & quick backward stroke
b) quick forward & slow backward stroke
c) both of the above
d) none of the above

17. Friction wheels with differential gear is used with
a) belt conveyor
b) cable belt conveyor
c) shaker conveyor
d) high angle conveyor

18. Calculate the capacity of Belt Conveyor in ton / hour for the following specification:
i) bulk density of material = 0.8 t/m^3 ii) material cord length = 1.2 m
iii) belt deflection angle = 30^0 iv) Angle of repose = 27°
v) Velocity = 120 m/min
a) 27 b) 32
c) 37 d) 42

19. The ratio of the actual load carried by the conveyor during its running period to the nominal capacity for these hours is known as
a) average loading factor
b) nominal factor
c) mean factor
d) differential factor

20. Sandwich conveyor is a type of
a) high angle conveyor
b) cable belt conveyor
c) chain conveyor
d) shaker conveyor

21. Rotation of impeller inside the pump forces water to enter in the suction pipe. This is effected due to

a) reduction
b) suction
c) revolution
d) None of the above

22. In the volute casing of a pump the velocity of air gradually decreases but pressure energy increases correspondingly. This happen in accordance with

a) Bernoulli's theorem
b) Pithagorus theorem
c) Graham's theorem
d) Hook's law

23. Which of the following has little or no effect on the development of head in a pump?

a) design of diffuser
b) curvature of impeller
c) delivery pipe range
d) speed of impeller

24. Turbine or Centrifugal pump works at its best efficiency while dealing with

a) exact head
b) reduced head
c) simple volute casing
d) diffusion channel

25. Capacity to continue pumping operation even if air enters into the water pipelines is known as

a) core
b) snore
c) driver
d) carrier

26. Which of the following problem will be encountered if head of the pump is much reduced?

a) quantity of water will decrease sharply
b) overload the motor
c) volute casing will be broken
d) balancing disc will be worn out

27. Starting by a centrifugal or turbine pump must require

a) priming
b) opening of valve
c) reciprocating
d) Snoring

28. Tail rope haulage is mainly used as

a) main rope haulage
b) haulage for waste disposal
c) as a buffer haulage inside the district
d) to replace endless haulage

29. Main advantage of using main and tail rope haulage is

a) no derailment of tub occur
b) suitable for high output
c) suitable for undulating roadways and one operator can drive both drums
d) long train of tubs can be attached

30. Squirrel cage motor is mainly used with

a) endless haulage
b) tail rope haulage
c) belt conveyor
d) shaker conveyor

31. Which of the following accessories is used with the over rope type haulage?

a) dog catch
b) smallman clip
c) lashing chain
d) khit

32. Which of the following safety devices is incorporated with the surface tippler?

a) automatic catch
b) back catch
c) screw clip
d) pull chord

33. Which of the following haulages is preferred for undulating roadways?

a) direct rope haulage
b) endless haulage
c) main & tail rope haulage
d) tail rope haulage

34. Which of the following haulages is used as main rope haulage?
    a) endless haulage
    b) direct rope haulage
    c) tugger haulage
    d) tail rope haulage

35. Which of the following haulages is situated at a lower level and empties are hoisted up the sloping track?
    a) endless haulage
    b) direct rope haulage
    c) tail rope haulage
    d) main and tail rope haulage

36. Operation of which of the following haulages is just opposite to that of direct rope haulage?
    a) tugger haulage
    b) gravity haulage
    c) tail rope haulage
    d) main and tail rope haulage

37. Which of the following haulages require two parallel tracks side by side?
    a) tugger haulage
    b) direct rope haulage
    c) tail rope haulage
    d) endless haulage

38. In which of the following haulages, any derailment shall cause for a heavy damage?
    a) endless haulage
    b) tail rope haulage
    c) main and tail rope haulage
    d) direct rope haulage

39. Jaw clutch is provided with
    a) tail rope haulage
    b) direct rope haulage
    c) endless haulage
    d) gravity haulage

40. The direct rope haulage system can also serve branch roads if the gradient is suitable and the road deviating at an angle of not more than
    a) 10° b) 20°
    c) 30° d) 40°

41. Name the machine that is used to give a suitable curvature to a piece of rail?
    a) backstay
    b) puller
    c) jim crow
    d) axle

42. What is the track gauge for tubs of $1.1 m^3$?
    a) 0.4 m b) 0.6 m
    c) 0.8 m d) 1 m

43. Which of the following factor is not a criterion to be considered for calculating the amount of super-elevation?
    a) radius of curve
    b) speed of train
    c) size of tub
    d) track gauge

44. The piece of rail given at the point of crossing is known as
    a) jazz rail
    b) check rail
    c) mono rail
    d) granby rail

45. Which of the following clutch is preferably used with direct rope haulage?
    a) dog clutch
    b) friction clutch
    c) centrifugal clutch
    d) all of the above

46. It is a device necessary to keep a driving motor running while stopping the driven machine.
    a) converter
    b) clutch
    c) coupling
    d) gear

47. A fluid coupling is also known as
    a) mechanical linker
    b) roller coupling
    c) flexible coupling
    d) hydraulic coupling

48. A flexible coupling is used between

a) driver and gear
b) driver and driven shaft
c) driver and fluid coupling
d) driver and clutch

49. Which of the following device absorbs shock of the vibrations resulting form misalignment?

a) clutch
b) gear
c) flexible coupling
d) motor

50. Which of the following clutches can only be engaged when the driving and driven shafts are nearly stationary or running at the same speed?

a) jaw clutch
b) friction clutch
c) centrifugal clutch
d) rack and pinion

51. Name the device that protects electric winding engines from excessive speed, overwinding and rapid acceleration.

a) depth indicator
b) lilly controller
c) slow banker
d) solenoid thrustor

52. Name the method of speed control of large winders usually of above 800 kW?

a) OCB filter
b) ACB filter
c) ward Leonard method
d) rheostatic control method

53. As per mining regulations, for every shaft exceeding 100m depth and during hoisting of men the speed should not exceed

a) 0.5 m/s
b) 1 m/s
c) 1.5 m/s
d) 5 m/s

54. When do you recommend some form of electric braking in addition to the mechanical braking for electrical winders?

a) for high diameter shaft
b) to safe guard electric installations
c) for deeper shaft
d) for economy in braking

55. The alternative name of koepe winder is

a) drum winder
b) friction winder
c) multirope winder
d) bi-cylindro winder

56. In koepe winders, the power is transmitted through the friction between

a) winding rope and lining of sheave
b) winding rope and tail rope
c) tail rope and skip
d) drum and koepe winders

57. Calculate the power of the motor, if the r.m.s torque for a winder is 120 kNm, winding drum diameter is 4.2 m; maximum rope speed is 8m/s?

a) 257 kW
b) 307 kW
c) 357 kW
d) 457 kW

58. Which of the following drum is employed for hoisting in deep mines as it reduces the net starting torque?

a) cylindro conical
b) by-cylindro conical
c) cylindrical
d) balancing cylindrical

59. Factor of safety required for koepe winding is

a) 1
b) 3
c) 5
d) 7

60. Factor of safety required for drum winders to be used for men winding is

a) 4
b) 6
c) 8
d) 10

61. What is the exact location of keps?

a) at pit bottom
b) at pit top
c) at mid set landing
d) at top of the cage

62. The decking difficulties in koepe winder is overcome by providing

a) keps
b) hinged platform
c) rope guide
d) flexible guide

63. Detaching hooks are used only with

a) drum winders
b) koepe winders
c) both drum and koepe winders
d) none of the above

64. Detaching hook is a safety device which acts when

a) the cage is at bottom
b) the cage is pit top
c) over wind takes place
d) the cage is at mid-landing position

65. The angle between the vertical plane of the pulley and the rope when the cage is at the pit top or pit bottom is known as

a) angle of draw
b) angle of fleet
c) angle of collimination
d) angle of repose

66. In case the angle of fleet exceeds 1.5°, which of the following effect shall take place?

a) vibration to headgear structure
b) shock to cage
c) wear and tear on pulley
d) wear of rope and pulley

67. In relation to pump, head is known as

a) distance between pump motor and discharge point
b) vertical distance between suction end to discharge point
c) distance between suction end to pump impeller
d) pump impeller to discharge point

68. The impeller of pump rotates rapidly within

a) motor of pump
b) suction pipe range
c) delivery pipe range
d) volute casing

69. Volute casing in a pump

a) has gradual increasing cross-section
b) has gradual decreasing cross-section
c) has uniform cross-section
d) has randomly increasing cross-section

70. Which of the following factor has little or no effect on the development of head?

a) diameter and speed of impeller
b) curvature of impeller
c) design of diffuser
d) distance between pump motor and delivery point

71. According to laws governing a pump, the relationship between water quantity (Q) and rotation of impeller (rpm) is

a) $Q = rpm$
b) $Q > rpm$
c) $Q \propto rpm$
d) $Q \propto 1/rpm$

72. For reduced head in turbine or centrifugal pump the following difficulties will arise

a) pump will lift reduced water
b) quantity of water delivered will increase and will overload the motor
c) motor capacity will reduce
d) impeller will not properly function

73. In order to dewatering while sinking is in progress and also for dewatering a sudden inundated water, the type of pump used is

a) face pump
b) submersible pump
c) turbine pump
d) vertical drill pump

74. Which of the following pump is used as main pump at the pit bottom sump?

a) submersible pump
b) multi-stage turbine pump
c) reciprocating pump
d) ramp pump

75. Which of the following accessory is not provided in centrifugal pump?

a) impeller
b) volute casing
c) balancing disc
d) foot valve

76. What does the Lay indicates?

a) lay indicates the direction of laying of strands in the rope
b) lay indicates the direction of laying of wires in the strand
c) lay indicates the type of rope
d) lay indicates the heaviness of rope

77. Which of the following centre core looks like an independent wire rope?

a) SSC
b) fibre core
c) IWRC
d) vegetable core

78. Which of the following type of rope has very smooth exterior surface?

a) round stranded
b) flattened stranded
c) full lock
d) half lock

79. Which of the following process eliminates the initial stretch in a wire rope?

a) pre-forming
b) pre-stressing
c) galvanizing
d) tempering

80. It is the process by which the wires and the strands are given the appropriate spiral shape by drawing the wires through a die. Name the process

a) Galvanizing
b) vulcanizing
c) pre-forming
d) pre-stressing

81. Removal of metals from outer wires in a rope is a type of

a) plastic wear
b) abrasive wear
c) differential wear
d) temporary wear

82. Corrosion in wire rope can be minimized by

a) applying proper load on it
b) operating it in an acid free site
c) proper lubrication with good quality lubricants
d) restricting dis-integration of fibres

83. Any obscure physical change in the rope due to repeated application of stress is

a) wear
b) corrosion
c) fatigue
d) deformation

84. Right hand ordinary lay wire rope construction is most useful for

a) winding
b) haulage
c) crane
d) bucket supporting rope

85. It is a weaker type of rope where strands are stitched side by side

a) round stranded rope
b) flat rope
c) flattened rope
d) locked coil rope

86. In belt conveyor, the belt is the load carrying media and bonded together with various layers. These are known as

a) woven fabric
b) carcass
c) pvc fabric
d) nylon fabric

87. Which of the following coating is done with the belt surface to make it fire-resistant?

a) pvc
b) nylon
c) rubber
d) bentonite

88. Trough shape of the belt conveyor is made with the help of

a) bottom roller
b) idler set
c) drive roller
d) snub pulley

89. Which of the following factor is not significantly related with the controlling of belt conveyor capacity?

a) belt speed
b) trough angle
c) belt width
d) design of chute

90. The ratio of load carried by the conveyor during its normal running period w.r. to the capacity at its nominal speed is called

a) belt factor
b) average loading factor
c) swelling factor
d) power factor

91. The series of iron container of scraper chain conveyor over which the flight with chain moves is known as

a) driving wheel
b) donga or pan
c) sprocket
d) drum

92. Which of the following locomotive do not carry the source of power with it during its operating time?

a) battery loco
b) diesel loco
c) trolley wire loco
d) compressed air loco

93. Tractive effort or tractive force depends on

a) rail track size
b) power of loco
c) weight of loco
d) number of mine cars

94. In calculating the tractive force of a loco, besides weight of loco what else is considered?

a) power feed system
b) frictional adhesion between locomotive wheels and rail track
c) draw bar
d) number of cars attached with it

95. In which of the locomotive there is maximum possibility of formation CO with the exhaust gas?

a) battery loco
b) diesel loco
c) trolley wire loco
d) compressed air loco

96. In which of the following locomotive, exhaust conditioner is provided?

a) trolley wire loco
b) compressed air loco
c) diesel loco
d) battery loco

97. The purpose of the following attachment is to eliminate the possibility of sparks and to cool down the temperature of hot gases?

a) friction clutch
b) flame trap

c) fluid coupling
d) Slag wool

98. Which of the following locomotive is not recommended to be used where the coal is liable to spontaneous heating?

a) battery loco
b) diesel loco
c) trolley wire loco
d) compressed air loco

99. Which of the following locomotive is suitable for long haul and require sufficiently high width of roadway?

a) compressed air loco
b) diesel loco
c) trolley wire loco
d) battery loco

100. In overhead wire loco the electricity is collected by

a) arm
b) pantograph
c) extended wires
d) power pack

101. A low tare-load ratio of mine cars has the following advantage

a) increases the number of trips of locomotives
b) increases the length of trains or cars
c) increases the capacity of cars i.e. trains
d) it increases the total energy required for the purpose of hauling

102. Which of the following is not a main parameter to be considered for a mine car?

a) tare-load ratio
b) stability of car
c) length of haul
d) co-efficient of space utilization

103. It is the ratio of the car capacity to the product of its maximum length, width and height

a) co-efficient of utilization of space
b) co-efficient of resistance
c) stability of car
d) tonne of load carried by the car

104. Which of the following do not increase the stability of a mine car?

a) limiting the ratio of the length of the body to the wheel axle base to 3:1
b) proper super-elevation of outer rail on curve

c) lowering the centre of gravity of cars
d) using strong alloys of huge weight in its construction

105. It is the ratio between resistance to the motion of a car along a straight level track with constant speed to the total weight of car

a) co-efficient of utilization of space
b) co-efficient of resistance
c) co-efficient of carrying capacity
d) co-efficient of tractive effort

106. One of the simplest and most widely used measures of vibration severity of machine is

a) machine rpm
b) machine amplitude
c) damage in machine foundations
d) rising of machine body temperature

107. Almost all machine vibration is due to one of these causes

a) looseness & resonance
b) inefficient operator
c) overload to the machine
d) lack of shock absorbing component

108. Misaligned machine component create one of the following

a) power overload
b) bending moment
c) machine fatigue ness
d) reduced rpm

109. When a machine vibrates vigorously and excessively at its natural oscillation rate and with an external aid is said to be experiencing

a) free swinging
b) resonance
c) harmonic oscillation rate
d) repetitive forces

110. Amplitude of vibration in a machine do not relates to one of the following

a) the size of the vibratory movement
b) speed of the movement
c) the force associated with the movement
d) duration of its running

111. root mean square or rms amplitude is an indication of

a) the amount of vibration energy in the machine
b) vibration speed attained by a machine

c) resonance in a machine
d) looseness in a machine

112. The rate at which a machine component oscillates is called

a) speed of machine
b) vibration frequency
c) rms frequency
d) indicator of machine condition

113. A ratio that indicates the relation between mine car capacity and its weight is known as

a) car stability
b) car utilization ratio
c) tare-load ratio
d) space utilization ratio

114. Which of the following in relation to mine car is true?

a) a low tare-load ratio increases the capacity of a train of cars
b) a low tare-load ratio increases the number of trips of locomotives
c) a low tare-load ratio increases the energy losses
d) a low tare-load ratio has increased length of siding in underground as well as in the surface

115. The ratio of car capacity to the product of its maximum length, width and height is called

a) co-efficient of utilization of space
b) co-efficient of resistance
c) co-efficient of stability of car
d) co-efficient of loading in a car

116. The average value of co-efficient of utilization of space of a mine car in Indian underground mining context varies from

a) 0.2 to 0.3 b) 0.4 to 0.5
c) 0.5 to 0.6 d) 0.7 to 0.9

117. Which of the following force is not acted on a mine car while it is in motion?

a) gravitational
b) torsion
c) tractive
d) centrifugal

118. In order to increase the stability of a mine car the limiting ratio of the length of the body to its wheel axle base generally remains as

a) 1 : 1 b) 2 : 1
c) 3 : 1 d) 5 : 1

119. It is the ratio between the interruptions to the motion of a car along a straight level track with constant speed to the total weight of car

a) co-efficient of utilization of space
b) co-efficient of resistance
c) co-efficient of adhesion
d) co-efficient of car stability

120. Which of following is not a selecting criterion of choice of type and size of car in a mine?

a) mode of loading and unloading into cars
b) haulage road cross-section
c) type and quantity of support items to be transported
d) system of transport adopted

121. Coal cutting machine is used

a) to cut and load coal at the face
b) to create free face
c) to avoid using explosive
d) to drive gallery and load coal onto stage loader

122. Now-a-days use of CCM has become obsolete due to

a) introduction of continuous miner
b) introduction of DERDS
c) introduction of coal plough
d) introduction of delay action detonators

123. Which type of cable is required for the operation of SDL?

a) proper insulated lead sheathed double armoured wire
b) concentric
c) 5-core flexible cable
d) 3-core non-flexible cable

124. What type of hydraulic fluid is required for LHD?

a) servo-68 b) HF8-68
c) servo-460 d) HP-90

125. What is the maximum suitable hauling distance for SDL to give best performance?

a) upto 25 m of haul length
b) upto 50 m of haul length
c) upto 75 m of haul length
d) upto 100 m of haul length

126. Which of the indigenous firm do manufacture SDL & LHD in India?

a) Joy mining machinery company
b) Atlas Copco
c) Eimco Elecon
d) Tractors India limited

127. What type of safety features are attached with LHD machine?

a) audio-visual alarm while reversing
b) front and rear light
c) dynamic and parking brake
d) all of the above

128. What type of ventilation is recommended for SDL / LHD?

a) 1 m^3 / minute/Kw of motor power
b) 5 m^3 / minute/Kw of motor power
c) 10 m^3 / minute/Kw of motor power
d) 15 m^3 / minute/Kw of motor power

129. Road header is used to drive

a) single heading
b) double headings
c) triple headings
d) more than three headings

130. Expected output from a continuous miner in underground

a) 100 tpd b) 500 tpd
c) 1000 tpd d) 1500 tpd

131. Which of the following type of support is to be used for the gallery run by LHD?

a) timber props
b) wooden cogs
c) hydraulic props
d) full grouted roof bolting

132. What is the maximum permissible gradient for LHD?

a) 1 in 1 b) 1 in 2
c) 1 in 6 d) 1 in 12

Answers

1. a	2. c	3. a	4. a	5. d	6. a	7. a	8. a
9. c	10. a	11. b	12. b	13. a	14. b	15. b	16. a
17. b	18. a	19. a	20. a	21. b	22. a	23. c	24. a
25. b	26. b	27. a	28. b	29. c	30. a	31. c	32. b

33. c	34. b	**35.** c	36. c	37. d	38. d	**39. b**	40. d
41. c	42. b	**43.** c	44. b	45. a	46. b	**47. d**	48. b
49. c	50. a	**51.** b	52. c	53. c	54. c	**55. b**	56. a
57. d	58. b	**59.** d	60. d	61. b	62. b	**63. a**	64. c
65. b	66. d	**67.** b	68. d	69. a	70. d	**71. c**	72. b
73. b	74. b	**75.** c	76. b	77. c	78. c	**79. b**	80. c
81. b	82. c	**83.** c	84. c	85. b	86. b	**87. a**	88. b
89. d	90. b	**91.** b	92. c	93. c	94. b	**95. b**	96. c
97. b	98. b	**99.** c	100. b	101. c	102. c	**103. a**	104. d
105. b	106. b	**107.** a	108. b	109. b	110. d	**111. a**	112. b
113. c	114. a	**115.** a	116. c	117. b	118. c	**119. b**	120. c
121. b	122. d	**123.** c	124. b	125. a	126. c	**127. d**	128. b
129. a	130. d	**131.** d	132. d				

CHAPTER - 4

MINE MANAGEMENT LEGISLATION AND SAFETY

1. What should be the degree of fleet angle?

a) 1.5° b) 2.5°
c) 3.5° d) 5°

2. Where you will provide waterseals?

a) with stowing pipe
b) isolation stoppings
c) with explosive cartridges
d) in water reservoir

3. Support at the goaf edge is made the strongest – why?

a) to keep the immediate roof intact
b) support requirement in other areas will be minimum
c) it will help roof to break
d) to resist coal bumps

4. Why lime is sprinkled on the accumulation of black damp?

a) it absorbs CO_2 in the black damp
b) it resists coal dust explosion
c) it resists gas explosion
d) it gives off H_2O to extinguish fire

5. The width of a manhole is kept not less than 0.75 m but not more than 1 m – why?

a) to allow 2 persons to enter easily for shelter
b) not to allow the tub to enter into the manhole
c) to keep stone dust bags etc. inside it
d) all of the above

6. Why galleries are sometimes staggered?

a) it will help to install transport system
b) to avoid excessive exposure of roof at a place
c) to provide good support to the roof
d) it will give maximum coal output

7. Why is it mandatory to remove silt from the sump?

a) to maximize the sump capacity
b) to maintain regular flow of water in mines

c) to maximize the head of water
d) to allow pump khalasi to enter

8. Why heavy stone dust barriers are located farther from the face?

a) it will help extinguish fire rapidly
b) the wave of explosion becomes stronger & stronger as it travels away from the face requiring maximum stone dust to tackle it
c) to diminish the possibility of dust explosion
d) to brighten the galleries away from faces

9. Why formation of 'V' between two goaves is avoided during depillaring?

a) to avoid the concentration of pressure at 'V' point
b) to minimize the requirement of support
c) to get maximum coal O/P
d) to prohibit air blast

10. Why a layer of coal is left against the shaley roof?

a) shaley roof has the tendency to depart from immediate coal roof
b) it makes the roof weaker
c) to avoid subsidence
d) to restrict inrush of water

11. At every below ground mine where there is no rescue station within its radius of A Kms, the owner shall establish on the surface a rescue room. A is given by,

a) 15 Km
b) 35 Km
c) 50 Km
d) 100 Km

12. It may be sufficient to provide one rescue room for a number of mines, if the total number of persons ordinarily employed in below ground working of all such mines does not exceed,

a) 2500
b) 5000
c) 7500
d) 10000

13. Which of the following functions of rescue station is not permitted by Chief Inspector even though the owner is allowed to establish a rescue room for group of mines having total no. of persons ordinarily employed is in excess of 5000

a) imparting initial training in rescue & recovery work
b) imparting refresher training to rescue trained person
c) providing support by its own rescue teams & equipment in case of major accidents
d) carrying out function of rescue room where there is no rescue room

14. How many rescue trained persons should be there in a rescue station to maintain a rescue brigade?

a) 12
b) 14
c) 16
d) 18

15. How many instructors should be there in a rescue station?

a) 2
b) 4
c) 6
d) 8

16. How many years of practical experience of below ground mines is mandatory for getting appointment of rescue superintendent?

a) 2
b) 3
c) 4
d) 5

17. Where the following qualification or experience is not required for the post of Instructor of a rescue station?

a) To be a rescue trained person
b) three years of practical experience of below ground mines
c) holds a manager's certificate with not restricted to opencast mines
d) holds a First Class Managers certificate of a type restricted to opencast workings

18. What should be the duration of posting a rescue trained person in a rescue station?

a) 1-5 years
b) 6-10 years
c) 11-15 years
d) 16-20 years

19. Which of the following apparatus, equipments is not recommended to keep at rescue room?

a) Breathing apparatus
b) Reviving apparatus
c) Smoke helmets
d) Scissors

20. How many Co- tubes to be kept at the surface of the mine where no rescue room is located close to the mine entrance?

a) 4
b) 6
c) 8
d) 10

21. Which of the following duties & responsibilities is not to be done statutorily by the Superintendent of rescue station?

a) he shall ensure that adequate stock of spare parts & supplies are kept in the station
b) he shall not countersign the records maintained under sub rule (1) or rule 13

c) he shall make periodical inspection of rescue station & apparatus under his control
d) he shall ensure that all the apparatus, equipments are maintained in perfect order

22. In the event of emergency at underground mine, Superintendent shall perform rescue & recovery work & within 'A' days shall send a report to the RI or CI of mines. 'A' is given by

a) 3 **b)** 5
c) 10 **d)** 14

23. The Manager of a below ground mine where more than 100 persons are ordinarily employed below ground shall ensure that at least 'A' numbers of rescue trend persons are readily available at surface at any time. A is given by

a) 5 **b)** 7
c) 9 **d)** 12

24. The Manager of a below ground, where more than 'A' persons are ordinarily employed shall also ensure that persons at the rate of one man for every hundred or part should be rescue trained. 'A' is given by,

a) 200 **b)** 400
c) 500 **d)** 700

25. Which of the following qualifications is not desirable for getting selection in training in rescue work?

a) he is between 21 & 30 years of age
b) holds a valid first aid certificate
c) he must have Diploma in the respect branch of engineering
d) he is certified by the qualified medical practitioner to be free from any organic disease or weakness

26. State the number of the schedule that must be followed for the refresher course of rescue trained person

a) III **b)** V
c) VII **d)** X

27. Every rescue trained person shall be re-examined once at least in every 'A' Month by a qualified medical practitioner. A is given by

a) 6 b) 12
c) 18 d) 24

28. The base that is established by the rescue team near to irrespirable zone for conducting rescue work is known as

a) rescue room
b) rescue station

c) fresh airbase
d) recovery zone

29. Which of the following provisions is not essential in a fresh airbase kept for the purpose of rescue work?

a) Reviving apparatus
b) Oxylog machine
c) Hygrometer
d) Flame safety lamp

30. Prior to going down the mine the leader of the rescue team shall take clear instructions from

a) Manager of the mine
b) Safety officer of the mine
c) Superintendent of rescue
d) General Manager Safety

31. While using rescue apparatus, the leader shall carry a watch to record the pressure of compressed oxygen at an interval of 'A' minutes. A is given by

a) 15 b) 20
c) 25 d) 30

32. What should be the maximum period for remaining inside the mine for doing rescue work using breathing apparatus?

a) 0.5 hr b) 1.5 hr
c) 2 hr d) 2.5 hr

33. What should be the minimum no. of persons in a rescue team using breathing apparatus?

a) 5 b) 6
c) 7 d) 8

34. In which schedule the signals for using by the members of the rescue team are prescribed?

a) V b) VI
c) VII d) VIII

35. No person will be allowed to commence second spell of work in irrespirable atmosphere until unless

a) he is qualified enough for the work
b) he refuses his breathing apparatus
c) he pays for it
d) he is examined and found fit by a qualified medical practitioner

36. In which schedule the list-of equipment to be kept at rescue station is prescribed?

a) I
b) II
c) III
d) IV

37. In which schedule the list of equipment to be kept at rescue room is prescribed?

a) I
b) II
c) III
d) IV

38. What percentage of employees should undergo initial medical examinations every year of a mine?

a) 10%
b) 20%
c) 30%
d) 40%

39. The initial medical examination of every person employed in the mine should be arranged within a period of 'A' years of the date so notified by the Manager. A is given by

a) 2
b) 3
c) 4
d) 5

40. In respect of every medical examination, the Manager of the mine concerned shall give at least 'A' days of prior notice in writing to the person to be examined. A is given by

a) 7 days
b) 14 days
c) 20 days
d) 30 days

41. In which form the Manager of the mine concerned shall give notice to the persons to be examined?

a) Form I
b) Form II
c) Form D
d) Form M

42. In which form the standards of the initial medical examination of all people seeking employment are laid down?

a) Form P
b) Form P-I
c) Form O
d) Form O-I

43. A person may appeal to the Manager for his re-examination even though the person has been declared medically unfit for the employment in mines. Which board will re- examine him?

a) safety promotion board
b) medical council
c) appellate medical board
d) board of scruitineers

44. Who is supposed to be the Convenor of the Appellate Medical Board?

a) Qualified medical officer of DGMS
b) Qualified medical officer nominated by CI in consultation with Welfare organization
c) Qualified medical officer in allopathic system of medicine employed in a state or central Govt. or Govt. undertaking
d) Any medical officer nominated by General Manager of the area.

45. In which form the standards of the medical reexamination by the Appellate medical Board are laid down?

a) Form P
b) Form Q
c) Form R
d) Form S

46. When do the manager submit annual return if a mine is abandoned?

a) within 15 days of such abandonment
b) within 30 days of such abandonment
c) within 45 days of such abandonment
d) within 60 days of such abandonment

47. When do the manager submit annual return if working thereof is discontinued over a period of exceeding sixty days?

a) within 45 days of such discontinuance
b) within 60 days of such discontinuance
c) within 90 days of such discontinuance
d) within 120days of such discontinuance

48. What should be the minimum number of employment when the owner, agent or Manager shall remain bound to designate 3 suitably qualified employees of the mine as workmen's Inspectors of the mine concerned?

a) 300
b) 500
c) 700
d) 1000

49. Identify the department from which workmen's Inspector is not considered?

a) Mining
b) Civil
c) Electrical
d) Mechanical

50. What is the minimum no. of person employed therein a mine when Mining Workmen's Inspector shall be assisted by one additional inspector?

a) 500
b) 1000
c) 1500
d) 2000

51. A workmen's Inspector shall hold office for a period of 'A' years from the date of his nomination. 'A' is given by,

a) 1 yr
b) 2 yr
c) 3 yr
d) 4 yr

52. What should be the minimum limit of experience for nominating a person as workmen's Inspector?

a) 3 Yr
b) 5 Yr
c) 7 Yr
d) 12 Yr

53. How many days in a week the workmen's Inspector is supposed to perform the duties as mentioned in rule 29 R?

a) 1 day
b) 2 day
c) 3 day
d) 4 day

54. In which form the workmen's Inspection shall record his report of inspection?

a) Form P
b) Form Q
c) Form M
d) Form U

55. In case of any difference in opinion between Workmen's Inspector & the Owner, Agent or Manager, the matter should be sent to

a) Director (Technical / Operation)
b) CMD of that subsidiary
c) Chief Inspector
d) Chairman of the company

56. What is the minimum no. of persons to be employed when the owner, Agent or Manager shall constitute a Safety Committee for promoting safety in the mine?

a) 100
b) 200
c) 300
d) 500

57. Who acts as Secretary to the Safety Committee constituted as per rule 29 T?

a) Manager
b) Safety Officer
c) Ventilation Officer
d) Sampling Incharge

58. How many officials or competent persons of mine the Chairman as per rule 29 U shall nominate?

a) 2
b) 3
c) 4
d) 5

59. One of the function of the Safety Committee is to meet at least once in 'A' days to consider the matter placed before the committee. 'A' is given by

a) 7 days
b) 15 days
c) 30 days
d) 60 days

60. The owner, Agent or Manager shall apprise the secretary of the Safety Committee of the action taken on the recommendation of the committee. What is the minimum time period of such reply?

a) 7 days
b) 15 days
c) 30 days
d) 60 days

61. What is the minimum stipulated quantity of drinking water to be provided in a mine or any part for every person employed at any one time?

a) 1 Lit
b) 2 Lit
c) 2.5 Lit
d) 3 Lit

62. When does the inspector give an order in writing to supply cool water to the employee of opencast workings?

a) where 100 or more persons are employed
b) when there is huge sun shine
c) when the employees do want
d) when the manager does want

63. What is the scale of accommodation of latrine for males in mines?

a) one seat for every 50 persons employed
b) two seat for every 50 persons employed
c) one seat for every 100 persons employed
d) five seat for every 100 persons employed

64. What is the scale of accommodation of latrine for females in mines?

a) one seat for every 25 persons employed
b) one seat for every 50 persons employed
c) one seat for every 75 persons employed
d) one seat for every 100 persons employed

65. What should be the minimum no. of persons working therein a mine at one time shall require the provision of latrines?

a) 25
b) 50
c) 75
d) 100 or more

66. Which of the following activities do not fall under the obligation of work persons for the purpose of sanitation in a mine?

a) no person shall intentionally damage or misuse the latrines
b) no person shall pollute the underground workings of a mine with excreta
c) all person employed inside the ground shall acquaint themselves with the arrangements provided in the section of the mine
d) all of the above

67. Which of the following certificate is considered as a valid first aid certificate for any persons working therein a mine?

a) Certificate from Medical Association of India
b) Certificate from local dispensary
c) Certificate from area level hospital
d) Certificate from St. John's Ambulance Association (India)

68. What should be the minimum number of person employing or any one-day require establishment of first aid room in a mine?

a) 25 b) 50
c) 75 d) More than 100

69. What is the minimum floor space required for a first aid room in a mine?

a) 8 m^2 b) 10 m^2
c) 12 m^2 d) 15 m^2

70. Where the number of persons employed in a mine is more than 'A', the in charge of first aid room shall be a whole time employee. 'A' is given by,

a) less than 200 b) less than 500
c) less than 750 d) more than 1000

71. Which of the following category of work persons are not bound statutorily to have first aid certificate & to carry first aid outfit while on duty?

a) Overman b) Mining Sirdar
c) Line helper d) Mechanic

72. In which form the notice regarding the hours of work is mentioned?

a) Form A
b) Form B
c) Form C
d) Form D

73. In which form the date of termination of any employee is registered?

a) Form B
b) Form P
c) Form C
d) Form D

74. In which form does the owner, agent or manager keep the record of leave with wages of employee?

a) Forms B & C
b) Forms C & D

c) Forms D & G
d) Forms G &H

75. What should be the minimum floor area of a shelter in a mine?

a) 10 m^2 b) 12 m^2
c) 14 m^2 d) 20 m^2

76. At any mine, wherein more than 'A' persons are employed, the chief Inspector shall give order to provide and maintain a canteen for use of all persons employed. 'A' is given by

a) 250 b) 350
c) 500 d) 750

77. The owner, agent or manager of a mine shall remain bound to appoint a qualified Welfare Officer, where the number of workers is 'A' or more. 'A' is given by

a) 250 b) 500
c) 750 d) 1000

78. In which register the reportable & minor accidents are recorded?

a) Form J
b) Form K
c) Form P
d) Form M

79. In which form the entry of persons inside the mine is registered?

a) Form B
b) Form D
c) Form C
d) Form K

80. What is the rate of disability allowance be given to a person declared medically unfit for employment?

a) 10% of his monthly wages
b) 20% of his monthly wages
c) 50% of his monthly wages
d) 75% of his monthly wages

81. What should be the minimum period of enforced absence in case of reportable injury?

a) 24 hrs b) 36 hrs
c) 48 hrs d) 72 hrs

82. Which of the following is not treated as 'Serious bodily injury'?

a) Permanent loss of any part of the body
b) Permanent injury to the sight or hearing

c) Injury to thumb of right hand for a period of 7 days
d) Permanent physical incapacity or fracture to any bone

83. Act shall not apply to any depth of excavation measured from its highest to its lowest point nowhere exceeding 'A' meters. 'A' is given for coal

a) 10 m
b) 12 m
c) 15 m
d) 20 m

84. Act shall not apply to any opencast mine engaged in the extraction of Kankar, gravel, ordinary clay, limestone where the depth of excavation measured from its highest to its lowest point nowhere exceeding 'A' meters. 'A' is given by

a) 6 m
b) 12 m
c) 15 m
d) 25 m

85. Act shall not apply to any opencast mine engaged in the extraction of Kankar, morrum, gravel, boulder, ordinary sand, ordinary clay, limestone where the number of persons employed on any one day does exceed 'N' number. 'N' is given by

a) 25
b) 50
c) 75
d) 100

86. In which section of Mines Act 1952 the provision on occupational health survey is mentioned?

a) 9
b) 9A
c) 22
d) 22A

87. Which of the following earnings is not included in the "ordinary rate of wages" of mine employees?

a) basic wages
b) dearness allowance
c) bonus excluding incentive for production
d) compensation in cash

88. Which of the following section of Mines Act & Mines Rule state the provision on disability allowance?

a) 9 & 23
b) 9A & 82A
c) 22 & 24
d) 43 & 44

89. Who is appointed as the chairman of the 'committee' made under the section 12 of Mines Act 1952 to consider the proposal for making rules & regulation under the Act?

a) a person in the service of the Government not being the chief inspector or inspector appointed by the Central Government of India

b) any inspector
c) a qualified Mining Engineer
d) Owner of the mine

90. Which section of the Mines Act 1952 speaks about the Power of Inspectors when causes of danger not expressly provided against exist or when employment of persons is dangerous?

a) 9
b) 22
c) 23
d) 24

91. Which section of the Mines Act 1952 gives power to Inspectors to prohibit employment in mines?

a) 22A
b) 23
c) 24
d) 25

92. Which section of the Mines Act 1952 & CMR 1957 impose bindings to give notice of accidents in mines?

a) 23 of Act & 9 of CMR
b) 30 of Act & 11 of CMR
c) 52 of Act & 122 of CMR
d) 71 of Act & 125 of CMR

93. Which of the following disease is not declared in the official Gazette of India as a disease connected with mining operation?

a) Silicosis
b) Pneumoconiosis
c) Ankylostomiosis
d) Manganese poisoning nervous type

94. Who else, apart from Owner, Agent or Manager shall report to the Chief Inspector in writing when he is convinced that the persons employed in a mine is suffering from a disease notified under subsection (1) of section 25 of Mines Act 1952?

a) Director (Technical)
b) General Manager
c) Safety Officer
d) Medical practitioner

95. Which section of Mines Act & provisions of Mines Rule restricts the employment of persons for not more than 6 days in a week?

a) 28 of Act & 47 of Rule
b) 32 of Act & 51 of Rule
c) 34 of Act & 63 of Rule
d) 43of Act & 79 of Rule

96. As per Mines Act 1952, the periods of work of any adult employee above ground shall not be more than "A" hours along with his interval for rest and he shall not work for more than "B" hrs continuously before he has had an interval of rest for at least 30 minutes. A and B are given by

a) 9 &1 b) 8 & 2
c) 12 & 5 d) 14 & 6

97. Which section of Mines Act gives exemption from the section regarding hours of employment above & below ground?

a) 37 b) 38
c) 42 d) 48

98. Which section of Mines Act 1952 prohibits the employment of women in underground mine?

a) 45 b) 46
c) 47 d) 48

99. Which section of Mines Act gives power to Central Government to exempt either absolutely or subject to any specified condition any local area or any mine for the operation of all or any provision of Act, Rules or Regulations?

a) 83 b) 85
c) 87 d) 88

100. As per 3rd schedule of Mines Rule, the number of first aid boxes to be provided in mines shall be @ of one for every 'A' Persons employed. A is given by

a) 100 b) 125
c) 150 d) 200

101. As per CMR 1957, competent person in relation to any work means a person who has attained the age of

a) 18 yrs b) 20 yrs
c) 21 yrs d) 25 yrs

102. 'General body of air' means the general atmosphere in a seam but does not include

a) atmosphere in roof cavities
b) general atmosphere in the sealed off area or any borehole drilled in coal or adjacent strata
c) atmosphere of goaved out areas
d) air of main return of the mine

103. As per CMR 1957, shot firer is a

a) competent person
b) official
c) officer
d) permit manager

104. In connection with blasting, misfire means

a) failure to ignite a detonator
b) failure to explode the entire charge or explosives in a shot hole
c) failure to connect the cartridges
d) insufficient stemming of shot holes

105. In which form the notice of opening required by section 16 of the Mines Act shall have to be submitted?

a) Form B
b) Form C
c) Form I
d) Form II

106. In which form the Owner, Agent or Manager of a mine shall submit monthly return to the Chief Inspector?

a) Form D
b) Form E
c) Form II
d) Form IA

107. In which form the Owner, Agent or Manager of a mine shall submit annual returns to the District Magistrate & Chief Inspector?

a) Form K
b) Form M
c) Form IIA
d) Form III

108. How many days in advance, the Owner, Agent or Manager shall give notice to the Chief Inspector, when they intend to abandon or discontinue work of a mine?

a) 30 days b) 40 days
c) 60 days d) 90 days

109. When is it intended to re-open a mine or seam after abandonment or distcontinuance for a period exceeding 60 days, the owner, agent or manager shall not less than 'A' days before resumption of mining operation give notice to the Chief Inspector. 'A' is given by

a) 30 days b) 45 days
c) 60 days d) 120 days

110. Notice of accident causing loss of life or serious bodily injury in connection with mining operations shall be given in Form IV-A to the District Magistrate, Chief Inspector & Regional Inspector within 'A' hours of every such occurrence. 'A' is given by,

a) 1 hr
b) 6 hr
c) 12 hr
d) 24 hr

111. What should be the minimum age for appearing in any examinations held by the Board of Mining Examinations?

a) 18
b) 19
c) 20
d) 21

112. What should be the minimum average output of an underground mine, where the manager must have first class manager ship certificate of competency?

a) 600 t/month
b) 1500 t/month
c) 2500 t/month
d) 5000 t/month

113. The Chief Inspector may give Managers permit to any persons holding an Overman's certificate to act as a Manager of any specified coal mine when the average monthly output does not exceed

a) 300 t/month
b) 600 t/month
c) 1500 t/month
d) 3000 t/month

114. In every underground coal mine the average monthly output of which exceeds 'A', the manager shall be assisted by a safety officer. 'A' is given by,

a) 2500 t
b) 5000 t
c) 7500 t
d) 10000 t

115. As per CMR 1957, what should be the minimum average monthly output of an underground mine, where the safety officer must have first class Manager's certificate?

a) 5000 t
b) 10000 t
c) 15000 t
d) 25000 t

116. In every underground coal mine the average output of which exceeds 'A' tonnes, the Manager shall be assisted by Assistant Managers. 'A' is given by,

a) 5000 t
b) 7000 t
c) 9000 t
d) 15000 t

117. In a gassy mine of 2nd & 3rd degree the average monthly output of which exceeds 'A' tonnes, the Manager shall be assisted by a Ventilation Officer. 'A' is given by,

a) 1000 t
b) 2500 t
c) 5000 t
d) 7500 t

118. What should be the maximum limit of aggregate horsepower of all heavy earthmoving machinery used in an opencast mine, when appointment of Engineer having degree or equivalent qualification in electrical or mechanical engineering recognized by the Central Government is made mandatory by the CMR 1957?

a) 250 hp
b) 500 hp
c) 750 hp
d) 1000 hp

119. How many numbers of Surveyors are required for an underground mine which produces 10,000 tonnes in a month?

a) 1
b) 2
c) 3
d) More than 3

120. How many days in a week, the Manager of a below ground coal mine shall visit the mine to see that the safety aspect is ensured?

a) 2 days
b) 3 days
c) 4 days
d) 5 days

121. Who shall be held responsible for the supply of materials & appliances for the purpose of carrying out of the provisions of the Act & Regulations in mines?

a) Manager
b) Owner/Agent
c) Safety officer
d) General Manager

122. In which regulation of CMR 1957, the duties of safety officers is stipulated?

a) 41
b) 41 A
c) 42
d) 42 A

123. Who shall inform the manager for any unusual change in the barometric pressure?

a) Overman
b) Sampling in charge
c) Ventilation officer
d) Assistant Manager

124. As per provision of CMR 1957, who shall be held responsible for determining the VEQ?
   a) Safety officer
   b) Ventilation officer
   c) Labour welfare officer
   d) General Manager

125. One of the duties of Ventilation officer as stipulated in the CMR 1957 is to arrange for water spraying at & within 'A' meter of the working places. 'A' is given by,
   a) 30 m b) 60 m
   c) 90 m d) 120 m

126. As per CMR 1957, unless otherwise directed the mining sirdar is supposed to securing safety of
   a) a district
   b) old panel
   c) total mine including surface
   d) total mine excluding surface

127. Which of the following materials are used to hold tubs on a gradient?
   a) stop block
   b) backstay
   c) tub rerailer
   d) sprags

128. Who shall ensure that no inexperienced person is employed on any work in the district except under the supervision of an experienced person?
   a) mining sirdar
   b) overman
   c) undermanager
   d) working inspector

129. It is expected that all timber supports of mines are to be withdrawn by
   a) bunton
   b) prop- withdrawer
   c) drop war wick
   d) jim crow

130. Who shall be held responsible to comply with the provision of regulation 177 of CMR 1957?
   a) mining sirdar
   b) shot firer
   c) overman
   d) undermanager

131. Which of the following job is not supposed to be done by the Timber man?
   a) to carry out the order of the Manager, undermanager
   b) to carry out the order of the Overman , Mining Sirdar
   c) to see that wood cuttings are not left in any workings below ground
   d) to arrange for the supply of timber material for support

132. The mine surveyor is supposed to record the facts related to workings which have approached to about 'A' meter from the boundary, disused workings or waterlogged workings. 'A' is given by,
   a) 35 m b) 45 m
   c) 55 m d) 65 m

133. What is the name of the place where the explosives are stored for the purpose of issuing it to an authorized person?
   a) explosive storage
   b) reserve station
   c) magazine
   d) firing station

134. The term Representative Factor (RF) is associated with
   a) mine drainage
   b) mine plan
   c) mine air sampling
   d) mine ventilation

135. In any shaft, ladder or strong construction may be used as a means of ingress or egress of persons employed in a mine. What should be the maximum inclination of such ladder from the horizontal?
   a) 30° b) 40°
   c) 80° d) 90°

136. What is the minimum distance stipulated between two shafts, inclines or outlets of a mine?
   a) 5.5 m b) 13.5 m
   c) 19.5 m d) 30 m

137. The diameter of the drum of any winding engine installed after Oct 25, 1955 shall be not less than 'a' times of the diameter of the rope. 'a' is given by,
   a) 60 b) 80
   c) 100 d) 150

138. What shall be the distance between the detaching hook & the detaching plate when the cage is at its normal position at the top of the shaft?

a) 1 m
b) 1.4 m
c) 1.8 m
d) 2.2 m

139. What is the name of the device used in a shaft exceeding 100 m depth to prevent over speeding & over winding?

a) automatic speed indicator
b) automatic contrivance
c) automatic depth indicator
d) automatic brake

140. What should be the distance upto which the guides shall be kept extended towards the bottom of the sinking shaft exceeding 130 m in depth?

a) 13.5 m
b) 16.5 m
c) 19.5 m
d) 22.5 m

141. Where the shaft exceeds 45 m in depth, the persons working at the bottom of the shaft shall be protected by a covering which shall be kept lowered within 'A' meters of the bottom of the shaft. 'A' is given by,

a) 22.5
b) 32.5
c) 42.5
d) 52.5

142. Identify one of the following conditions which does attract the provision of prohibiting the use of any rope for winding

a) any doubt regarding fitness of the rope
b) rope which has been spliced
c) the breaking load of the rope at any point is not less than 10 times the maximum static load
d) none of the above

143. What should be the minimum depth of a sinking shaft for which winding rope made of cold drawn steel wire is recommended to use?

a) 40 m
b) 60 m
c) 80 m
d) 100 m

144. Where white metal is used for capping of ropes, the tapered position of the socket shall not be less than 'A' times of the diameter of the rope. A is given by

a) 4
b) 6
c) 8
d) 10

145. What should be the maximum temperature of the white metal pouring into the socket for the purpose of capping?

a) 300° C
b) 363° C
c) 415° C
d) 525° C

146. What temperature of the socket is suitable for pouring white metal into it?

a) 100° C
b) 150° C
c) 200° C
d) 300° C

147. What should be interval of recapping of ropes other than the rope of Koepe system of winding?

a) once in every month
b) once in every three months
c) once in every six months
d) once in every twelve months

148. What is the maximum period of service expected from all parts of suspension gear?

a) 4 yrs
b) 6 yrs
c) 8 yrs
d) 10 yrs

149. It shall be the duty of the Engineer or other competent person to examine every winding rope once at least in 30 days by passing the rope at a speed not exceeding 'A' m/ sec. A is given by

a) 0.5 m
b) 1 m
c) 1.5 m
d) 2 m

150. What is the least number of stop-block to be installed at the top of every inclined plane to arrest tubs from running out of control?

a) 1
b) 2
c) 3
d) 4

151. What should be the maximum stipulated distance between runaway switch and stop block?

a) length of train of tubs + 2 m
b) length of train of tubs + 4 m
c) length of train of tubs + 6 m
d) length of train of tubs + 10 m

152. Which of the following attachment is used behind the set of ascending tubs?

a) back stay
b) stop block
c) drop war wick
d) safety catches

153. The diameter of winding drum shall not be less than 'A' times the diameter of rope. 'A' is given by

a) 10 b) 25
c) 50 d) 100

154. Efficient telephonic communications in any below ground coal mine should be provided when a system of haulage roadways & conveyors extends to a distance of more than 'A' meters. 'A' is given by

a) 100 m b) 200 m
c) 400 m d) 600 m

155. The maximum voltage of electrical signals in underground mines having supported on insulators is

a) 30 V b) 60 V
c) 125 V d) 220 V

156. What should be the maximum gradient while tubs standing on the track shall be effectively held by brakes or securely coupled to the haulage rope?

a) 1 in 20 b) 1 in 30
c) 1 in 40 d) 1 in 50

157. What is the minimum interval of recapping a haulage rope, which is once capped?

a) 3 months b) 6 months
c) 12 months d) 24 months

158. What is the maximum gradient where locomotives cannot be used?

a) 1 in 5 b) 1 in 10
c) 1 in 12 d) 1 in 15

159. What should be the maximum gradient of all roads for trucks, dumpers or other mobile machinery?

a) 1 in 4 b) 1 in 8
c) 1 in 10 d) 1 in 14

160. Which of the following stipulation is true for working under railways, roads etc?

a) working may be allowed with yield pillar technique
b) longwall method of working is only permitted
c) no workings shall be made at or to any point within 45 m of such railway, public roads etc.
d) working with stowing is permissible

161. Where multi section or contiguous seams or sections are worked in a mine, the pillars in one seam or section shall be vertically above or below the pillars. This statutory provision is not attracted when the strata are inclined at an angle of more than 'A' degrees from horizontal. 'A' is given by

a) 10° b) 15°
c) 20° d) >30°

162. Where two or more seams or sections are worked in a mine, the pillars in one seam or section shall be vertically above or below the pillars. The parting left between any two such seams or sections shall not be less than 'A' meters in thickness at any place. A is given by

a) 0.5 m b) 1 m
c) 2 m d) 3 m

163. At the top of every shaft or winze where cages are used suitable keps are provided. This provision is not applicable only when

a) more than 10 persons are in the cage
b) speed is 1 m per second
c) there is koepe system of winding
d) depth of shaft is less

164. Number of persons to be allowed to ride in the same cage or same deck of a cage at one time shall be fixed by

a) safety officer of the mine
b) mine manager
c) mine foreman
d) director of mines safety

165. As per MMR 1961, Cl has permitted that the total load of authorized number of persons ride at any one time in any cage shall not exceed 'A' percent of the maximum load when materials are wound. A is given by

a) 20% b) 40%
c) 60% d) 80%

166. As per MMR 1961, no winding rope shall be used in a shaft exceeding 1500 m in depth if its safety factor is less than

a) 2 b) 3
c) 4 d) 5

167. Identify the wrong statement from the below stated statutory remarks

a) the top of every opencast working shall be kept fenced
b) fencing shall be erected if excavation operation extends within a distance of 30 m of public road or building

c) fencing to be done around the subsided area in mines
d) every entrance to a shaft, winze, chute or other dangerous place shall have efficient fencing

168. The generic term used for the method study and work measurement techniques aiming at best "utilization of available resources i.e. men, money, material, machinery" is known as

a) house keeping
b) statistical control
c) work study
d) work distribution

169. The planning, organizing, directing and controlling of the procurement, development, compensation, integration and maintenance of people for the purpose of contributing to the organizational goals is called

a) personnel function
b) personnel management
c) personnel policy
d) industrial relations

170. It is the key information, directives usually written to help personnel department in accomplishing its objectives or functions

a) personnel policy
b) personnel relations
c) personnel contacts
d) labour welfare

171. It's a type of achievement test related to measuring an applicants knowledge relevant to his/her trade

a) aptitude test
b) personality test
c) dexterity test
d) trade test

172. The test that determines whether an applicant has the capacity or hidden ability to learn given work if he is given proper training

a) aptitude test
b) performance test
c) personality test
d) intelligence test

173. This test helps to discover an applicant's cleverness to work with his hands and fingers when the job requires skilful assembling operation?

a) personality test
b) dexterity test

c) aptitude test
d) interest test

174. Counseling is a type of

a) patterned interview
b) unguided interview
c) aptitude test
d) directed interview

175. Which of the following is the fringe benefit of non-monetary nature?

a) retirement benefits
b) insurance benefits
c) good parking space
d) investment plans

176. Which of the following is the facilitative class of welfare measures?

a) paid holidays
b) sports
c) social get-together
d) transport

177. Which type of communication is performed when Manager production informs Manager maintenance regarding break down of a machine?

a) formal vertical communication
b) informal vertical communication
c) formal horizontal communication
d) informal horizontal communication

178. How much Kilo calories of energy is obtained from 1 litre of oxygen consumed?

a) 1 Kcal
b) 2 Kcal
c) 3 Kcal
d) 5 Kcal

179. What is the full form of ACGIH?

a) Association of commercial group in housing
b) American consulate general in hygiene
c) American conference of governmental industrial hygienists
d) Asian conference of governmental industrial hygienists

180. What is the recommendation of ACGIH on continuation of work when deep body temperature of workers exceeds A^0C? A is given by

a) 32°C
b) 34°C
c) 36°C
d) 38°C

181. Which of the following is an example of smooth muscle?

a) heart
b) biceps
c) stomach
d) triceps

182. Which of the following is grouped under cumulative trauma disorder (CTD)?

a) arthritis
b) cardiac arrest
c) heat stroke
d) pneumoconiosis

183. Which of the following is a muscular-skeletal disorder?

a) pneumoconiosis
b) silicosis
c) myositis
d) asbestosis

184. Dry bulb and Wet bulb temperature is measured by

a) conical flask and thermometer
b) asman hygrometer
c) kata thermometer
d) Oxylog II machine and thermometer

185. The level of energy expenditure or oxygen consumption which is required to keep a healthy individual alive but not performing any external work is called?

a) limit of continuous work
b) total calories requirement of a person
c) basal metabolic rate
d) relative aerobic strain

186. Maximum heart rate (HR) which any individual can attain is

a) 80 bpm
b) 100 bpm
c) (220 – age) bpm
d) (250 – age) bpm

187. What do you mean by heart rate reserve (HRR)?

a) Average working heart rate – resting heart rate
b) maximum heart rate - resting heart rate
c) 220 - age
d) resting heart rate + 35 beats

Answers

1. a	2. b	3. c	4. a	5. b	6. b	7. a	8. b
9. a	10. a	11. b	12. b	13. a	14. d	15. a	16. d
17. d	18. a	19. d	20. d	21. b	22. a	23. a	24. c
25. c	26. c	27. b	28. c	29. b	30. c	31. b	32. b
33. a	34. d	35. d	36. a	37. b	38. b	39. d	40. c
41. d	42. b	43. c	44. a	45. a	46. b	47. c	48. b
49. b	50. c	51. c	52. b	53. b	54. d	55. c	56. a
57. b	58. d	59. c	60. b	61. b	62. a	63. a	64. b
65. b	66. d	67. d	68. b	69. b	70. d	71. c	72. a
73. a	74. d	75. c	76. a	77. b	78. a	79. c	80. c
81. d	82. c	83. c	84. a	85. b	86. b	87. c	88. b
89. a	90. b	91. a	92. a	93. c	94. d	95. a	96. c
97. b	98. b	99. a	100. c	101. b	102. b	103. a	104. b
105. c	106. c	107. d	108. b	109. a	110. d	111. c	112. c
113. b	114. b	115. c	116. b	117. b	118. c	119. b	120. c
121. b	122. b	123. c	124. b	125. c	126. a	127. d	128. a
129. b	130. b	131. d	132. d	133. c	134. b	135. c	136. b
137. c	138. c	139. b	140. d	141. a	142. b	143. c	144. c
145. b	146. a	147. c	148. d	149. a	150. a	151. d	152. a
153. d	154. d	155. a	156. a	157. b	158. d	159. d	160. c
161. d	162. d	163. c	164. d	165. b	166. c	167. b	168. c
169. b	170. a	171. d	172. a	173. b	174. b	175. c	176. d
177. c	178. d	179. c	180. d	181. c	182. a	183. c	184. b
185. c	186. c	187. b					

CHAPTER - 5

ROCK MECHANICS & ROOF SUPPORTING

1. According to CMR 1957, formulation of which of the following rules is mandatory?

a) SSR
b) RMR
c) RQD
d) RQI

2. Which of the following regulation of CMR 1957 provides stipulation on SSR?

a) 102 b) 104
c) 106 d) 108

3. During setting of supports in underground, a lid is used over the prop. The length of such lid shall not be less than

a) 10 cm b) 20 cm
c) 40 cm d) 50 cm

4. As per the statute where a prop is set on loose material, a flat base piece is to be used which should be A cm in length. A is given by

a) 5 cm b) 25 cm
c) 50 cm d) 75 cm

5. During formulation of RMR of any rock type, 5 (five) parameters are considered, which of the following parameter is not considered?

a) layer thickness
b) structural features
c) face advancement
d) ground water seepage

6. If a rock type has RMR value 70, then what will be its roof class?

a) poor
b) fair
c) good
d) very good

7. In pressure arch theory, which of the following factor is not considered?

a) depth of cover
b) width of gallery

c) strata Characteristics
d) prop density

8. Which of the following immediate roof type is treacherous and very unreliable?

a) sand stone
b) coal
c) shale
d) slate

9. The object of roof supporting in underground is

a) to support immediate roof
b) to prevent sagging of roof
c) to prevent bed separation
d) all of the above

10. With the widening of gallery the bending force increases. If this is not checked by providing artificial support then which of the following will not happen?

a) roof sagging
b) bed separation
c) air blast
d) reduced roof fall

11. Staggered junction in underground will pose which of the following problems?

a) difficulty in setting supports
b) problem in laying transport system
c) problem in coursing work
d) difficulty in air quantity measurement

12. Which of the following is not a contributory factor for the cause of the subsidence?

a) stowing is not done
b) depth of cover is more
c) friable nature of superincumbent rock
d) void is not supported effectively

13. In relation to subsidence 'Angle of draw' may be defined as

a) angle between vertical and point of zero subsidence
b) angle between horizontal and point of zero subsidence
c) angle between vertical and centre of underground gallery
d) angle between vertical and final line of break

14. Which of the following is the first indication of subsidence?

a) widening of patches
b) small cracks on surface
c) fire in underground district
d) pressure building on underground support

15. What will be safe cover i.e. the tolerance limit for extraction of coal pillars with caving where railway line is on the surface? T is the seam thickness in meter

a) 9 × T
b) 18 × T
c) 27 × T
d) 54 × T

16. Which of the following is not affected by the subsidence?

a) agricultural land
b) water table
c) loss of coal
d) volume of firedamp

17. Which of the following roof type do not generally give warning prior to its break?

a) laminated roof
b) massive roof
c) shaley roof
d) coal as immediate roof

18. Which of the following may be called as quick setting support?

a) roof bolt
b) pit prop
c) square chock
d) steel arch

19. In order to install one safari support in underground Bord & Pillar working how many holes are to be drilled at coal pillar side?

a) 1
b) 2
c) 3
d) 4

20. SSR do not generally specifies about

a) quantity of supports
b) quality of supports
c) type of supports
d) skill of timber crew

21. SSR of any underground mine shall be approved by

a) Colliery Manager
b) Safety Officer

c) Director (Technical)
d) Director of Mines Safety

22. Choice of support do not depend on

a) working height
b) nature of roof
c) coal strength
d) blast vibration

23. Prop density is defined as

a) weight carried by a single prop
b) time elapsed to set a prop
c) number of props required to support one sq meter area
d) number of person required to erect a prop

24. Identify from below the advantage of steel support over timber support

a) easy to install
b) recovery and re-use
c) prior indication of roof weighting
d) cheap in cost

25. Fall of weak immediate roof in underground in layers is known as

a) flaking
b) beam failure
c) guttering
d) arch failure

26. Which of the following location is mostly preferred to erecting a square chock?

a) at face
b) at drive head of conveyors
c) at junction
d) at tunnel

27. Powered support is used in

a) bord and pillar mining
b) longwall mining
c) opencast mining
d) room and pillar mining

28. Underset prop is a

a) tapered prop
b) pit prop
c) prop whose axis remains in between vertical and normal to the seam
d) prop whose axis is normal to the dip of the seam

29. Steel arches is normally recommended to use as permanent support at

a) face
b) gallery junction
c) main traveling roadway
d) main dip section

30. What is the expected range of LBC of a 2.5 m long, 15 cm diameter timber prop?

a) 5-10 KN
b) 15-20 KN
c) 50-60 KN
d) 120-130 KN

31. In case of wooden props, if length to diameter ratio is higher then it is obvious that

a) LBC is higher
b) LBC is lower
c) LBC remains same
d) Props becomes very costly

32. Which of the following bolting practice do not require any quick setting cement capsule in the drill hole?

a) recoverable type of bolt
b) non-recoverable type bolt
c) bamboo bolt
d) side stitching

33. Below mentioned are some features or cases of roof bolting. Identify one of such case where roof bolting may be ineffective?

a) requirement of such support which is fire-proof in nature
b) handling and transporting
c) About clearance in the roadway
d) application in highly watery face

34. At prop free front face, the roof support is provided by

a) hydraulic chocks
b) cantilever bar
c) triangular chocks
d) steel prop

35. Dry and wet rot terminology are used to denote

a) power of timber
b) quality of timber
c) diseases of timber
d) specification of timber

36. Chockmate is used in metal mines. Which of the following coal mine support is similar to chockmate?

a) triangular chock
b) square tool set chock
c) wooden cog
d) cross bar

37. Hydraulic oil of a hydraulic prop is a combination of

a) 50% oil emulsion and 50% water
b) 25% oil emulsion and 75% water
c) 1% oil emulsion and 99% water
d) 5% oil emulsion and 95% water

38. The chemical or physical alteration of rock at its surface by its reaction with atmospheric gas and aqueous solutions. This phenomenon is known as

a) rock fracture
b) rock strength
c) rock weathering
d) rock stability

39. The objective of such activity is to restrict displacements of the country rock to elastic orders of magnitude and to maintain as far as practicable the integrity of both the country rock and the unmined remnants within the ore body. Identify the mining activity?

a) driving of gallery
b) maneuvering the machines
c) drilling of holes in faces
d) supporting the roof

40. How many principal stresses a homogeneous, linear matrix equation developed in a stress field has?

a) 1
b) 2
c) 3
d) 5

41. Which of the following behaviour describe quantitatively the stress-strain rates related in a material under load?

a) constitutive behaviour
b) homogeneous behaviour
c) complex behaviour
d) Bieniawski's in-situ behaviour

42. Which of the following diagram can represent one aspect of bi-axial stress acting on a point with respect to a set of reference axes?

a) Mohr's circle diagram
b) Rose diagram

c) intraformational shears diagram
d) Goodman diagram

43. The plane dividing the sedimentary rock into beds or strata is called

a) fracture plane
b) bedding plane
c) plane of discontinuity
d) geo-technical plane

44. It is the concept introduced by Deere to quantify discontinuity spacing in rock masses

a) RMR
b) RQD
c) roof class
d) JRC

45. It is an electrical resistance thermometer made from a semi-conductor having a large, negative temperature co-efficient useful to measure the rock temperature

a) calibrator
b) thermistor
c) micro-seismic monitor
d) geophone

46. It is the basic technique used in mapping surface or underground exposures to recording data for all discontinuities

a) scanline survey
b) geodetic survey
c) traverse survey
d) stadia survey

47. Which type of drilling is till the reliable way of exploring the interior of a rock mass prior to mining?

a) core drilling
b) percussive drilling
c) rotary drilling
d) hydraulic drilling

48. Name the diagram where the strikes of discontinuities are oriented at about 5° interval?

a) Mohr's diagram
b) Coward diagram
c) Hock and Brown diagram
d) Rose diagram

49. The plotting of planes and their poles is carried out with the aid of

a) great circle
b) lambert
c) stereonet
d) counting net

50. It is necessary to correct the observed pole concentrations to account for the number of discontinuities of a given set of orientation and the borehole or scanline. Who has developed this correction?

a) Mahtab
b) Terzaghi
c) Goodman
d) Bieniawski

51. Which of the following is not considered in Bieniawski's geo-mechanics classification?

a) rock strength
b) RQD
c) ground water condition
d) layers thickness

52. Laubscher modified Bieniawski's geo-mechanics classification by introducing which of the following criterion?

a) proposed for the 6th parameter or class over the Bieniawski's classification
b) introduced relationship between unsupported underground excavation spans and the CSIR geo-mechanics classification
c) Each classes of Bieniawski are divided into sub-classes A & B
d) introduced some assessment on all classes other than joint condition as proposed by Bieniawski

53. Which process of deformation indicates sudden loss of strength across a plane following little or no permanent deformation?

a) ductile deformation
b) effective stress
c) brittle fracture
d) residual strength

54. What do you mean by effective stress?

a) It is the stress at which permanent deformation first appears
b) It is the stress which governs the gross mechanical response of a porous material
c) It is the stress obtained after considerable post-peak deformation
d) It is the stress which is applied to the specimen at a constant stressrate

55. The technique to determining the uniaxial compressive strength and deformability of rock material are given by

a) NIRM
b) CSIR
c) NGI
d) ISRM

56. Which of the following is known as point load index?

a) (14 + 0.175 D) Is
b) P / D^2
c) $\sigma_m = {}^1/_3$
d) $S = C + \sigma \tan \theta$

57. Which of the following test may be used to provide an indirect estimate of uniaxial compressive strength?

a) point load test
b) servocontrolled test
c) displacement test
d) post peak test

58. Which attachment can monitor the axial deformation of a cylindrical specimen?

a) polar stereonet circle
b) linear variable differential transformer (LVDT)
c) brittle-ductile transition stress recorder
d) triaxial extensometer

59. Which criterion helps to predict development of maximum strength under various stress combinations?

a) residual strength criterion
b) yield strength criterion
c) peak strength criterion
d) tensile cut-off criterion

60. "A crack will extend only when the total potential energy of the system of applied forces and material decreases or remain constant with an increase in crack length" - Who has given this concept?

a) Coulomb
b) Terzaghi
c) Bieniawski
d) Griffith

61. A renowned scientist in the year 1977 studied the development of rock fracture around a bored raise in a pillar in a mineralized shale at Mount Isa mine, Australia and found that the elastic stress around the raise of the pillar was approximately half of the mean value of 170 MPa measured in a laboratory tests. Who is the Scientist?

a) Griffith
b) Brown
c) Brady
d) Bieniawski

62. Who has proposed that the shear strength parameter is not constant but is continuously variable with (β), an angle to the major principal stress direction?

a) Brown
b) Jaeger
c) Brady
d) Serafim

63. Which of the following cell is sometimes used to investigate the shear behaviour of discontinuities?

a) load cell
b) triaxial cell
c) lead cell
d) extensometer

64. Which of the following is the value of normal stiffness, Kn in respect of normal stress-normal displacement linear behaviour of discontinuities?

a) 1
b) 2
c) 3
d) constant

65. Which of the following stiffness/deformation is calculated when slope to the shear stress – shear displacement curve is highly variable and exceedingly difficult to predict?

a) normal stiffness
b) joint roughness co-efficient (JRC)
c) modulus of deformation
d) shear stiffness

66. Computational methods of stress analysis fall into two distinct categories – one of them is intregral, what is the other?

a) differential method
b) boundary element method
c) finite element method
d) hybrid schemes

67. When the combined dynamic and static stresses exceed the strength of the rock mass, there is a tendency

a) causing local relaxation in the structure and lead to slip
b) of increasing zone of induced stress
c) of creating a source for such stress waves which do not propagate through rock medium
d) to correlate the dynamic stresses with released energy magnitude

68. Crown hole is a type of

a) continuous or trough subsidence
b) discontinuous subsidence
c) plug subsidence
d) funneling

69. Chimney caving involves the progressive migration of an unsupported mining activity and the sudden mode of formation rather than progressive one is known as

a) sink holes
b) block caving subsidence
c) progressive hanging wall caving
d) plug subsidence

70. Mining in thin, flat-dipping, tabular ore bodies by long wall technique give rise to

a) discontinuous subsidence
b) plug subsidence
c) chimney subsidence
d) continuous subsidence

Answers

1. a	2. d	3. d	4. d	5. c	6. c	7. d	8. c
9. d	10. d	11. b	12. b	13. d	14. c	15. d	16. d
17. b	18. b	19. d	20. d	21. d	22. d	23. c	24. b
25. a	26. c	27. b	28. c	29. c	30. d	31. b	32. a
33. d	34. b	35. c	36. c	37. d	38. c	39. d	40. c
41. a	42. a	43. b	44. b	45. b	46. a	47. a	48. d
49. c	50. b	51. d	52. c	53. c	54. b	55. d	56. b
57. a	58. b	59. c	60. d	61. c	62. b	63. b	64. d
65. d	66. a	67. a	68. b	69. d	70. d		

CHAPTER - 6

DRILLING AND BLASTING

1. A building where explosives and detonators are stored is called

a) shelter
b) magazine
c) store
d) house

2. The drilling pattern followed in underground coal mine is

a) wedge cut
b) fan cut
c) coromant cut
d) drag cut

3. The portable apparatus which provides the current necessary for firing electric detonators is called

a) charger
b) exploder
c) condenser
d) dynamo

4. What is the full form of PETN?

a) penta ethane tetra nitrate
b) penta erythritol trinitrate
c) penta erythritol tetra nitrate
d) penta ethane tolluine nitrogen

5. Which of the following is true for ordinary electric detonator?

a) instantaneous type
b) delay type
c) plain detonator
d) fired by safety fuse

6. A delay detonator has a delay element introduced between

a) priming charge and base charge
b) fuse head and priming charge
c) neoprene plug and neoprene sleeve
d) detonator tube and fuse head

7. The delay detonators and non-delay detonators are distinguished physically by

a) The colours of lead wires
b) base charge
c) priming charge
d) neoprene plug

8. Which of the following detonators are used with P5 explosives (solid blasting)?

a) instantaneous type detonators
b) short delay aluminum incendive detonators
c) carrick short delay non-incendive detonators
d) aluminum based long delay detonators

9. What are the available delay numbers with copper tube only to be used with solid blasting?

a) 0 – 3 b) 0 – 6
c) 0 – 10 d) 0 – 20

10. Which of the following detonators are used mostly in oil and mineral prospecting?

a) plain detonators
b) electric short delay detonators
c) ordinary long delay detonators
d) seismic detonators

11. A detonating fuse like cordtex is generally used in

a) blasting in underground coal face
b) tunneling
c) drift
d) deep hole blasting

12. Detonating relays are generally used for the purpose of blasting in

a) drift
b) cross-cut
c) solid blasting face
d) opencast working

13. It is the instrument used to testing continuity of an electric circuit for blasting

a) tacheometer
b) blastometer
c) blast scarper
d) blast crimper

14. The drilling pattern followed in small drifts

a) wedge cut
b) fan cut
c) drag cut
d) burn cut

15. Which of the following cut gives greater advance per round of blasting in tunnels or drifts of small area?

a) wedge cut
b) horizontal drilling
c) pyramid cut
d) coromant cut

16. The maximum number of shots that a shotfirer may fire in any shift by using a multi-shot exploder

a) 40 b) 60
c) 80 d) 160

17. No drill shall be used for boring a shot hole unless it allows a clearance of at least "A" cm over the diameter of the explosive cartridge. A is given by

a) 0.5 b) 1
c) 2 d) 3

18. No shot shall be fired unless the length of fuse is at least "A" meter. A is given by

a) 1.2 m b) 1.8 m
c) 2.5 m d) 4 m

19. The shotfirer shall not fire more than "A" shots in one round of blasting

a) 10 b) 15
c) 25 d) 50

20. To deal with the misfires a relieving hole shall be so placed that at no point shall it be nearer than 'A' cm from the misfired hole. A is given by

a) 5 cm b) 15 cm
c) 20 cm d) 30 cm

21. In which regulation of CMR 1957, the provisions of dealing with misfires are given?

a) 168 b) 169
c) 177 d) 178

22. In case of opencast working. Where any permanent building or structures not belonging to the owner lies within the danger zone, the aggregate maximum charge in all holes fired at one time shall not exceed

a) 565 gm
b) 1 Kg
c) 2 Kg
d) 2.75 Kg

23. It is given in the statute that when two working places below ground have approached within A metre of each other, the shotfirer shall fire in any of the two faces only. A is given by

a) 4.5 m
b) 8.5 m
c) 15 m
d) 18 m

24. As per the statute the key of the firing apparatus shall be retained throughout the shift in the possession of

a) mining sirdar
b) overman
c) explosive carrier
d) shotfirer

25. In no case shall the well insulated cable be less than A m long. A is given by

a) 12 m
b) 14 m
c) 16 m
d) 18 m

26. When stemming is insufficient then there is chance of

a) over breakage of coal
b) excessive vibration
c) blown out shot
d) high powder factor

27. Which of the following is not dependent on efficient breaking of rock?

a) correct type of explosive
b) correct amount of charge per hole
c) type of exploder
d) proper stemming

28. Amount of explosive to be charged in a single shot hole is not dependent on

a) nature of rock to be broken
b) hole depth
c) dia of hole
d) quality of detonating fuse

29. Deck loading is very useful when

a) strata consists of soft rocks
b) strata consists of friable rocks

c) strata consists of alternate band of hard and softer rocks
d) seam water bearance is high

30. When explosive charges in a hole is separated by air gaps in stead of stemming materials then the process is known as

a) deck loading
b) air decking
c) detonating
d) priming

31. Pop shooting or plaster shooting is a type of

a) primary blasting
b) secondary blasting
c) muffling
d) clay capping

32. We understand millisecond as

a) $1/10^2$ th part of second
b) $1/10^3$ th part of second
c) $1/10^5$ th part of second
d) $1/10^6$ th part of second

33. Which of the following explosive are recommended for solid blasting practice in underground coal mine?

a) gunpowder + LOX
b) OCG + ANFO
c) soligex, unigex
d) SG 80%

34. Which of the following explosive are recommended for deep hole blasting?

a) SG 80%, OCG & ANFO
b) Polar Ajax
c) LOX
d) gelignite 60%

35. In solid blasting practice which of the following type of initiation is preferred?

a) direct
b) inverse
c) direct & inverse
d) split

36. It is one of the oldest drilling technologies where hole is drilled by striking a number of blows at short intervals on the rock by a chisel type tool and between the blows the tool is rotated. The drilling is called
    a) rotary drilling
    b) percussive drilling
    c) diamond drilling
    d) hydraulic drilling

37. In this process, holes can be drilled from surface or underground working at any angle to the horizontal and used mainly for coring. The drilling process is called
    a) churn drilling
    b) percussive drilling by rods
    c) diamond drilling
    d) tubular drilling

38. During drilling, the hole gets filled with cuttings and has to be cleaned out frequently. This is done with the help of
    a) derrick
    b) calyx shot drilling
    c) sludger
    d) v-chisel

39. Sometimes a rod or chisel breaks in the drill hole during drilling. Name the device that may be used to catch the broken piece
    a) crow's foot
    b) picker
    c) liner
    d) churn bit

40. Which type of device is recommended for good core recovery from soft rock?
    a) single tube core barrel
    b) double tube core barrel
    c) saw toothed crown
    d) roller bits

41. Which of the following apparatus is suitable for drilling while approaching water logged underground workings?
    a) jack hammer
    b) hand held electric drill
    c) auger drill
    d) burn side boring apparatus

42. Which of the following is the oxidizing agent in an explosive?
    a) charcoal
    b) aluminum
    c) ammonium nitrate
    d) magnesium carbonate

43. Which of the following is used as a fuel in an explosive?
    a) sodium nitrate
    b) sulphur
    c) sodium chloride
    d) nitroglycerine

44. Which of the following is treated as base explosive?
    a) gun powder
    b) potassium nitrate
    c) Nacl
    d) TNT

45. Which of the following is added as sensitizers in explosive?
    a) Nacl
    b) NH_4NO_3
    c) NG
    d) Charcoal

46. Which of the following reagents do share around 75% in an explosive?
    a) oxidizing agent
    b) explosive base
    c) combustible substances
    d) sensitizers

47. Which of the following has poor water resistant property?
    a) ANFO
    b) Slurry explosive
    c) Emulsion explosive
    d) NG based explosive

48. Which of the following agent is used to give sheath in a permitted sheathed explosive?
    a) Nacl
    b) NG
    c) $NaHCO_3$
    d) Charcoal

49. Calculate the total resistance for 20 numbers of electric delay detonators connected in parallel, each detonator has resistance of 2 ohms and resistance of connecting wire and blasting cable is 8 ohms and 3 ohms respectively?

a) 8.1 ohms
b) 9.1 ohms
c) 10.1 ohms
d) 11.1 ohms

50. Which of the following prime characteristic the nonel blasting has?

a) it has greater shock to the surrounding
b) it is noiseless in character
c) it has tremendous effect on explosive column
d) it can not be used in a place where there is a chance of stray current

Answers

1. b	2. a	3. b	4. c	5. a	6. b	7. a	8. c
9. b	10. d	11. d	12. d	13. b	14. c	15. d	16. c
17. d	18. a	19. c	20. d	21. c	22. c	23. a	24. d
25. d	26. c	27. c	28. d	29. c	30. b	31. b	32. b
33. c	34. a	35. b	36. b	37. c	38. c	39. a	40. b
41. d	42. c	43. b	44. d	45. c	46. a	47. a	48. c
49. d	50. b						

CHAPTER - 7

GEOLOGY

1. Protodyakonov strength number is used to denote

a) rock designation
b) hardness of rocks
c) rock specific gravity
d) rock luster

2. It is an important constituent of granite and a chief constituent of sandstone where it occurs as broken form. Its hardness is 7 (seven). Name the mineral.

a) magnetite
b) topaz
c) orthoclase
d) quartz

3. Rocks that are formed by the cooling of molten material (called magma) at or relatively near the earth surface is called

a) igneous rocks
b) sedimentary rocks
c) metamorphic rocks
d) cryatalline

4. It is more or less parallel sided vertical wall of igneous rock formed due to upward intrusion of molten magma through fissures or cracks and is a common occurrence in coalfields. Guess it as

a) sill
b) laccolith
c) lava
d) dyke

5. On the basis of which content the igneous rocks are classified as acid rocks and basic rocks?

a) magnetite
b) hematite
c) bauxite
d) silica

6. The plane of contact between the two series of strata is called

a) homogenity
b) heterogeneity

c) unconformity
d) dip and strike

7. It is the junction plane of one bed of rock with another

a) conformity
b) dip of bed
c) strike of bed
d) bedding plane

8. It is a compound of $CaCO_3$ and $MgCO_3$ in various proportions

a) magnetite
b) laterite
c) siderite
d) dolomite

9. If sandstone is the original rock then what is its metamorphic rock?

a) slate
b) gneiss
c) quartzite
d) marble

10. If granite is the original rock then what is its metamorphic rock?

a) gneiss
b) slate
c) schist
d) mica

11. A part of any stream or rock that is exposed at the surface is known as

a) fault
b) fold
c) outcrop
d) dyke

12. The crest of fold where strata are bent up to form an arch is called

a) syncline
b) anticline
c) outlier
d) swilley

13. It is an irregularity where the bed thins out generally due to erosion by river or stream. This is known as

a) roll
b) wash out
c) fold
d) barren ground

14. In respect of fault, the vertical displacement of the fractured bed is called

a) heave
b) hade
c) throw of fault
d) fault plane

15. A fault that runs at some angle between the dip and strike of the bed is called

a) dip fault
b) strike fault
c) oblique fault
d) throw of fault

16. Two theories are known to explain the heavy accumulation of vegetable and organic matter that formed coal seams. If one of the two theories is drift theory, what is the other?

a) beam theory
b) keystone theory
c) insitu theory
d) stratified theory

17. The geological age of gondowana rocks is believed to be during

a) archaeans to cambrians
b) cambrian to silurian
c) carboniferous to jurassic
d) cretaceous to pliocene

18. Dull, friable appearance that soil the finger and most impure band in coal is known as

a) clarain
b) fusain
c) durain
d) vitrain

19. As per the sized gradation of coal, the size of rubble coal is

a) 51 mm to 200 mm
b) 25 mm to 50 mm
c) 0 mm to 24 mm
d) any unscreened size

20. In order to calculate useful heat value in Kcal per Kg of non-coking coal, besides ash percentage what is the name of other character which is considered?

a) carbon
b) moisture
c) volatile
d) sulphur

21. Caking index is also known as

a) protodyakonov index
b) agglutinating index
c) plasticity index
d) shatter index

22. It is another method of washing which separate good quality coal from its impurities through a simple process of particle stratification?

a) pulsitation
b) jigging
c) pulverization
d) infusion

23. The gas formed by blowing a mixture of stream and air through a bed of hot coal is known as

a) coal gas
b) water gas
c) producer gas
d) coke oven gas

24. Water gas is a combination of

a) $CO + H_2O$
b) $CO + H_2$
c) $CO + N_2$
d) $CO + CH_4$

25. Which of the following reserve is least in quantity?

a) proved
b) indicated
c) inferred
d) mineable

26. India's coal is approximately 'A' percentage of World's coal reserve. A is given by

a) 0.2%
b) 1%
c) 8%
d) 15%

27. The process of removal of loose soil or rock particles during storm, along the course of the blowing wind is defined as

a) attrition
b) deflation
c) denudation
d) mantle

28. The process of wear and tear of the exposed country rocks is defined as

a) attrition
b) abrasion
c) deflation
d) suspension

29. What is dunes ?

a) wind-borne particles
b) wind-formed deposits of sand
c) pedestal rock masses
d) transverse oasis

30. It is a buff coloured deposit made up of angular fragments of unaltered mineral grains and is characteristically unstratified. The thickness of such deposit may vary from few inches to hundreds of feet

a) run-off
b) fly-off
c) pot-holes
d) loess

31. It is the property by virtue of which it allows water to travel through its pore-spaces or other openings and found to be proportional to the square of the diameter of the grains forming the rock.

a) viscosity
b) permeability
c) seepage
d) artesian spring

32. Underground water emerging on the surface in the form of seepages and springs is found to form loose superficial deposits of silica or calcium carbonates. Such deposits are known as

a) sinters
b) karst
c) caverns
d) stylolites

33. The low-lying lands where the water table has reached the land surface and which commonly occur along food plains of rivers and in low lying sea-shores. Such areas are known as

a) lakes
b) swamps
c) basins
d) water table

34. The topographic depressions that accommodates lakes are known as
    a) crater lakes
    b) aeolian lakes
    c) lake basins
    d) horn-shoe lakes

35. Glaciers are masses of
    a) solid mineral
    b) earth's crust
    c) solid ice
    d) frozen dust

36. It's a mere openings of any shape or size which act as avenues for the magma to rise and spread upon earth's surface in the form of lava.
    a) swamp
    b) reef
    c) moraine
    d) volcano

37. The nature of eruption of volcano is principally guided by
    a) size of conduit
    b) physical and chemical character of magma
    c) crater
    d) volcanic cones

38. Seismic shocks that originate due to crustal movements are defined as
    a) superficial earthquakes
    b) tectonic earthquakes
    c) focus earthquakes
    d) P- waves

39. The exact spot underneath the earth's surface at which an earthquake originates is known as
    a) epicenter
    b) focus
    c) shake-waves
    d) surface waves

40. The delicate instrument that records earthquake is known as
    a) magnitude scale
    b) rikhter
    c) seismographs
    d) vibscanner

41. These are wavy undulations developed in country rocks whenever the region is subjected to severe pressure or stress
    a) fault
    b) fold
    c) dyke
    d) sill

42. When axial plane of a fold is vertical and either of the limbs have the same amount of dip then such fold is described as
    a) asymmetric
    b) symmetric
    c) fan
    d) chevron

43. The horizontal component of the apparent displacement of a bed, measured along the direction of dip of the fault is
    a) throw of fault
    b) heave of fault
    c) hade of fault
    d) horsts

44. If it is found that a younger bed completely covers up and advances much beyond the limits of the underlying beds then the structure is called
    a) non-conformity
    b) overlap
    c) complexity
    d) netslip

45. The study of fossils within rock beds and their proper utilization in elucidating the past history of the earth is called
    a) mineralogy
    b) petrology
    c) palaeontology
    d) structural geology

46. In palaeontology the conversion of remains of plants and animals into rock is known as
    a) fossils
    b) petrification
    c) moulds
    d) carbonization

47. During which transportation, the organism is decomposed and it loses nitrogen, oxygen and other volatile constituent?

a) evolution
b) sedimentation
c) crystallization
d) carbonization

48. The hollows left within the rock beds are filled up with mineral matter giving rise to

a) moulds
b) casts
c) fossils
d) imprints

49. Amongst the vertebrates, remains of reptiles occur abundantly in the rocks of

a) palaeozoic age
b) mesozoic age
c) cainozoic age
d) pleistocene age

50. The extensive lava-flows giving rise to flat-topped mountains and plateaus is known as

a) decan traps
b) volcano
c) swamp
d) loess

51. The top most horizon of the tertiary succession in Assam is known as

a) surma series
b) dihing series
c) barail series
d) jaintia series

52. The branch of Geology that deals principally with the mode of occurrence, origin, distribution, classification and association of all minerals and rocks of economic importance is called

a) engineering geology
b) structural geology
c) mineralogy
d) economic geology

53. A deposit must contain at least certain percentage of metal in it and the lowest admissible limit of metallic content of an ore is known as

a) simple ore
b) economic ore

c) tenor
d) ore mineral

54. In metalliferrous deposit, the ore minerals generally occur in association with some non-metallic minerals known as

a) late magmatic mineral deposit
b) cap rock
c) ore shoots
d) gangue

55. The mineralized vertical solution joints in carbonate country rock containing valuable deposits of metallic and non-metallic minerals is known as

a) ladder vein
b) saddle reefs
c) gash vein
d) grouting

56. The different geological periods during which mineral deposits were formed in abundance in certain sectors of globe are commonly known as

a) syngenetic period
b) metallogenetic period
c) epigenetic period
d) sublimation period

57. The mineral deposit in solid rock is called

a) ore
b) lode
c) gangue
d) lithology

58. A natural mineral substance of iron oxide, clay and sometimes manganese is called

a) shale
b) silt
c) ochre
d) tuff

59. The ratio of volume of voids in a rock or soil to its total volume is known as

a) lithology
b) plasticity
c) permeability
d) porosity

60. Most of the Indian diamond comes from

a) Rakha area
b) Panna area
c) Hatti area
d) Malanjkhand

Answers

1. b	2. d	3. a	**4. d**	5. d	6. c	7. d	**8. d**
9. c	10. a	11. c	**12. b**	13. b	14. c	15. c	**16. c**
17. c	18. b	19. b	**20. b**	21. b	22. b	23. c	**24. b**
25. d	26. b	27. b	**28. b**	29. b	30. d	31. b	**32. a**
33. b	34. c	35. c	**36. d**	37. b	38. b	39. b	**40. c**
41. b	42. b	43. b	**44. b**	45. c	46. b	47. d	**48. b**
49. b	50. a	51. b	**52. d**	53. c	54. d	55. c	**56. b**
57. b	58. c	59. d	**60. b**				

CHAPTER - 8

SURVEYING

1. What is the basic principle of chain surveying?

a) dialing
b) chaining
c) traversing
d) triangulation

2. Which shape of the plotting of the measurements collected during chain surveying is preferred?

a) equilateral triangle
b) obtuse-angled triangled
c) square
d) rhombus

3. The point selected on the main survey lines are called

a) temporary stations
b) main stations
c) subsidiary stations
d) auxiliary points

4. The lines joining the subsidiary stations are called

a) main lines
b) tie lines
c) projected lines
d) straight lines

5. The main principle of surveying should be

a) working from part to the whole
b) working from whole to the part
c) working through check lines
d) working through tie lines

6. The longest of the chain lines used in making a survey is generally regarded as

a) triangular line
b) base line
c) tie line
d) offset line

7. **The accuracy of the whole chain surveying depends on the straightness and accuracy of**
   a) straight line
   b) tie line
   c) base line
   d) check line

8. **A line of joining the apex of a triangle to some fixed point on the side opposite or a line joining some fixed points on any two sides of a triangle known as**
   a) base line
   b) check line
   c) plotting line
   d) tie line

9. **A line that checks the accuracy of the framework and enables the surveyor to locate the interior details which are far away from the main chain lines is called as**
   a) check line
   b) tie line
   c) perpendicular line
   d) offset

10. **In a survey, the position of the details such as boundaries, buildings, fences, roads, nullahs etc. measured by means of lateral measurements. These measurements are called**
    a) proof line
    b) offset
    c) tie line
    d) main line

11. **How the building that is considerably oblique to the chain lines is located?**
    a) check line
    b) range tie
    c) range and check ties
    d) fencing

12. **What should be the maximum length of the shorter offset when its direction is set out by eye or by swinging the tape on the chain line?**
    a) 1 m
    b) 5 m
    c) 10 m
    d) 15 m

13. **Preliminary inspection of the area to be surveyed is called**
    a) triangulation
    b) reconnaissance

   c) staffing
   d) marking

14. **The small compact hand instrument used for accurately finding the foot of the perpendicular from a given point to a line and setting out a right angle at a given point on a line. The instrument is known as**
    a) cross staff
    b) French cross staff
    c) optical square
    d) dial

15. **The art of determining the relative heights or elevations of points or objects on the earths surface is known as**
    a) leveling
    b) reconnassing
    c) staffing
    d) checking

16. **A fixed reference point of known elevation is called**
    a) vertical level
    b) horizontal level
    c) bench mark
    d) axis

17. **The staff reading taken on a point of unknown elevation from the same set up of the level is known as**
    a) back sight
    b) fore sight
    c) intermediate sight
    d) change point

18. **When the instrument is correctly léveled then height of plane of collimation is synonymous with**
    a) plus sight
    b) height of instrument
    c) turning point
    d) intermediate sight

19. **Which of the following is not a level?**
    a) dumpy level
    b) wye level
    c) tilting level
    d) miners level

20. Which is used when leveling of the highest precision is required?

a) telescope
b) invar staff
c) tape
d) object glass

21. Which of the following system is used to working out the reduced levels of points from the staff readings taken in the field?

a) bench marking
b) ranging system
c) rise and fall system
d) reconnaissance

22. The observed reading on a staff held at A was 3.5m. The staff was found to be 50 cm off the vertical through its bottom. Find the correct staff reading at A?

a) 2 m
b) 2.464 m
c) 3.464 m
d) 4 m

23. Given that the RL of the floor is 100.5; staff reading on the floor 1.5; reading on the staff held upside down against the underside of the tee-beam is 3.5; Find the height of the beam above the floor level?

a) 2 m
b) 3 m
c) 4 m
d) 5 m

24. It is the method of leveling in which the heights of mountains are found by observing the temperature at which water boils. The method is called

a) profile leveling
b) check leveling
c) hypsometry
d) techeometry

25. Find the corrections for curvature for a distance of 2 km?

a) 0.214 m
b) 0.314 m
c) 1.04 m
d) 4 m

26. The method of leveling adopted to determine the difference of level between two points at a considerable distance apart with great precision is known as

a) reciprocal leveling
b) cross-sectioning
c) check leveling
d) differential leveling

27. Find out the leveling in which the change in atmospheric pressure is recorded?

a) trigonometrical leveling
b) profile leveling
c) differential leveling
d) barometric leveling

28. The elevations and depressions of the surface of the ground are shown on a map by means of any one of the following lines. Which is the line?

a) object
b) collimation
c) contour
d) back sight

29. The error due to imperfect focusing of the eyepiece and object glass is known as

a) errors due to level and staff
b) errors in sighting
c) errors due to focusing tube
d) error in bubble tube

30. Name the method which is particularly suitable when a contoured map of hill is required

a) by squares method
b) tacheometric method
c) cross-section
d) indirect method

31. The full form GIS is

a) geological information system
b) geodetic information system
c) geographic information system
d) global information system

32. It is the art of determining and representing the relative heights or elevations of different points on the surface of the earth in a vertical plane

a) surveying
b) leveling
c) scaling
d) correlating

33. It is the device used for measuring fractional parts of the smallest division of the main scale

a) shrunk scale
b) diagonal scale

c) vernier scale
d) comparative scale

34. It is a simple device attached to the wheel of any vehicle and registers the number of revolutions of the wheel. Knowing the circumference of the wheel, the distance traversed may be obtained

a) passometer
b) pedometer
c) speedometer
d) odometer

35. In order to get work of highest precision, which of the following tape is used for measuring base lines in triangulation?

a) synthetic tape
b) invar tape
c) linen tape
d) steel tape

36. The length of a line measured by means of a 30m chain was found to be 590.25m, instead of its known to be as 602.5m. What was the actual length of the chain?

a) 30.26 m
b) 30.36 m
c) 30.42 m
d) 30.62 m

37. A 25 m chain was found to be 0.05 m too long after chaining 1200m. It was found to be 0.2 m too long after chaining 2000 m. If the chain was correct before commencement of the work find the true distance?

a) 2001.2 m
b) 2002.2 m
c) 2003.2 m
d) 2005.2 m

38. A 100 m tape is held 1.5 m out of line. What is the true length?

a) 98.98 m
b) 98.89 m
c) 99.89 m
d) 99.98 m

39. In traverse surveying the directions of survey lines are fixed by

a) forming a network of triangles
b) angular measurements
c) running of check lines
d) arranging equilateral triangles

40. The horizontal angle between the true meridian and a line is called

a) magnetic meridian
b) arbitrary meridian
c) azimuth
d) whole circle angle

41. Every line has two bearings e.g. fore bearing and back bearing. If fore bearing is less than 180° then what will be the back bearing?

a) back bearing = fore bearing - 180°
b) back bearing = fore bearing + 180°
c) back bearing = fore bearing
d) back bearing = 180^0 - fore bearing

42. The bearing of a line AB is 146° 20′ and the angle ABC is 132° 24′. What is the bearing of BC?

a) 88° 44′
b) 92° 44′
c) 98° 44′
d) 108° 44′

43. Which of the following statement in respect of theodolite is true?

a) it measures horizontal angle only
b) it measures vertical angle only
c) it measures both horizontal and vertical angles
d) it does not measure any angle at all

44. In work of ordinary precisions, which of the following error is negligible?

a) error of closure
b) instrumental error
c) natural error
d) personal error

45. By which rule, the total error in latitude and departure is distributed in proportion to the lengths of the sides?

a) transit rule
b) bowditch rule
c) centesimal rule
d) reversal point rule

46. It is a graphical method of surveying in which the field work and plotting are done simultaneously

a) theodolite traversing
b) compass traversing
c) chain traversing
d) plane tabling

47. Pick out the disadvantage for plane tabling?

a) it is suitable for preparing small scale maps
b) it is most rapid
c) it is not suitable for work in wet climate
d) contours and irregular objects may be represented accurately

48. Tacheometry is a branch of angular surveying in which one of the following is entirely eliminated?

a) horizontal distances of points are measured
b) vertical distances of points are measured
c) chaining is done more accurately
d) primary objective is to prepare contoured maps

49. Fixed hair and movable hair methods are the classification of which method of tacheometry?

a) tangential method
b) stadia method
c) inclined sights
d) vernier scaling method

50. A tacheometer survey is mainly conducted for the purpose of

a) contouring and filling in detail
b) calculating the deflection angles with the help of theodolite and chain
c) chaining in a smooth ground more accurately
d) setting the curve over rough ground with theodolite

51. A nautical mile is

a) the distance measuring two points between north and south pole
b) distance measured along the great circle joining two points which subtend one minute or arc at the centre of the earth
c) distance measured along the great circle joining two points which subtend one second of arc at any point on the circumference of the earth
d) the distance between earth and moon

52. What is the celestial pole?

a) It is the rotation of all celestial bodies from north pole to south pole of earth
b) it is the rotation of all celestial bodies from east to west around the sun
c) revolution of all celestial bodies from east to west round a point called celestial pole
d) it is an imaginary sphere upon the earth's surface

53. It is the instrument used in determining the area of the plots especially when the boundaries are irregular or curved

a) compass
b) coniometer
c) theodolite
d) planimeter

54. The difference in the planimeter readings was 0.896 when the area of 100 sq.cm was measured by a planimeter with the anchor point outside. With the same setting of the tracing arm and with anchor point outside, another figure was traversed clockwise and the difference between the initial and final readings was found to be 1.86. What is the area of the figure?

a) 187.58
b) 197.58
c) 207.58
d) 227.58

55. What is the fundamental adjustment of any leveling instrument?

a) the line of collimation and the axis of the telescope should not coincide with one another
b) the line of collimation should be parallel to the bubble axis
c) the bubble axis should not be perpendicular to the vertical axis
d) the line of collimation should not be parallel to bubble axis

56. The principle of reversal for level and theodolite is

a) if there is any error in a certain part of the instrument, it is doubled by reversing the position of the instrument
b) even though the instrument is out of adjustment accurate results can be obtained by reversing the observations
c) for any instrumental error, take the average of two observations taken at reversal
d) for any instrumental error, take the average of any two observation and double it

57. This is one of the adjustments made in cooke's reversible level

a) not to place the line of collimation in the axis of the telescope
b) to place the line of collimation at right angles to the vertical axis
c) to place the line of collimation at right angles to the horizontal axis
d) not to make the axis of the bubble perpendicular to the vertical axis

58. It is a minor instrument capable of measuring angles upto 120° and reads to 1 minute

a) Y level
b) box sextant
c) dumpy level
d) tilting level

59. A theodolite was set up at a distance of 150m from tower. The angle of elevation to the top of the parapet was $10.8'$ while the angle of depression to the foot of the wall was $3^{\circ}12'$. Find the height of the tower?

a) 31.18 m
b) 33.48 m
c) 35.18 m
d) 40.28 m

60. What do you mean by subsidence surveying?

a) shifting of surface structure to enable mining operation
b) depression of the surface as a result of mining operation
c) it is the art of finding out the magnitude of subsidence
d) it is the procedure to know the amount coal taken out vis-à-vis the area of mining in underground

61. Which of the following is important in relation to subsidence surveying?

a) to measure change in heights of different surface
b) to locate depressions
c) to selecting the site of observation stations
d) the measuring the angles of different positions on surface

62. In relation to subsidence; it is obvious that the angle of draw determines the

a) volume of coal extracted from below the ground
b) depth of coal extracted at that point of surface
c) size of the area of influence
d) effect of strains on the surface structures

63. In longwall working in a flat measures, in order to get greater part of information, a single observation line should be laid

a) at any positions
b) at right angles to the direction of advance
c) at any direction parallel to the advance
d) at a direction parallel to the top gate road

64. Find out one such criterion from below mentioned factors which do not have any control to laying out observation lines for subsidence surveying?

a) shape and size of the subsidence area exposed on the surface
b) method of extraction whether longwall or bord and pillar
c) nature of ground surface
d) distance of the depressed ground from the entrance of mine

65. In Bord & Pillar working or in places where the nature of subsidence is exposed to be irregular it is a good practice to

a) arrange for one observation line
b) divide whole area into squares and to arrange for two sets of parallel observation lines
c) select some angular points at right angles to the tail gate
d) provide stations at irregular distance apart

66. For precise leveling, some standards as laid down by the International Geodetic Association should be adopted; which is as

a) $\sqrt{\text{length of line in miles} \times 2}$
b) $1.2\text{mm} \times \sqrt{\text{length of line in miles} \times 2}$

c) $1.75\text{mm} \times \sqrt{\text{length of line in miles} \times 2}$
d) $2\text{ mm} \times \sqrt{\text{length of line in miles} \times 2}$

67. What are the contour lines?

a) these are the lines which meet each other at certain points
b) these lines are made to have knowledge on the extent of extraction made in opencast mines
c) these lines are formed by joining points of equal height above MSL and they may be straight, wavy etc depending on the configuration of land surface
d) these lines are made only to see the gentle slope of the ground

68. What indication we get when contour lines lie closer?

a) it means that slope of land is gentle
b) it means that slope of land is steep
c) it means that the land is flat
d) it does not give any indication

69. It is an inclination of a bed from horizontal dip observed in any direction and necessarily lesser than the full dip

a) strike
b) full dip
c) apparent dip
d) fault

70. The characteristic feature of a fault is such that the ends of the broken strata overlap and the seam is duplicated along the line of the fault. Identify its type?

a) reversed fault
b) normal fault
c) cross-cut
d) drift

71. This is an instrument used for mechanically reducing, copying or enlarging plans in any desired proportion within its range. Name the instrument

a) planimeter
b) eidograph
c) coniometer
d) compass

72. During 1980's the most notable technological advances in the field of exploration and surveying have been in the form of

a) Gyro-theodolite
b) EDM

c) GPS
d) Laser planar

73. Which of the following survey instruments is designed to work based on the satellite?

a) EDM
b) Gyro
c) GPS
d) eidograph

74. It is a surveying method based on trigonometrical proposition that if one side and three angles of a triangle are known, the remaining sides can be computed by the application of sine rule. Name the surveying method

a) plane surveying
b) triangulation
c) contouring
d) tacheometric surveying

75. It is a method of leveling adopted to determine the difference of level between two points at a considerable distance apart with great precision

a) hypsometry
b) profile leveling
c) reciprocal leveling
d) trigonometrical leveling

Answers

1. d	2. a	3. c	4. b	5. b	6. b	7. c	8. b
9. b	10. b	11. c	12. d	13. b	14. c	15. a	16. c
17. c	18. b	19. d	20. b	21. c	22. c	23. d	24. c
25. b	26. a	27. d	28. c	29. b	30. b	31. c	32. b
33. c	34. d	35. b	36. d	37. d	38. d	39. b	40. c
41. b	42. c	43. c	44. c	45. b	46. d	47. c	48. c
49. b	50. a	51. b	52. c	53. d	54. c	55. b	56. a
57. b	58. b	59. c	60. c	61. c	62. c	63. b	64. d
65. b	66. c	67. c	68. b	69. c	70. a	71. b	72. c
73. c	74. b	75. c					

CHAPTER - 9

MINERAL DRESSING

1. Processing of minerals to get valuable content of it is known as

a) milling
b) monitoring
c) extraction
d) separation

2. Liberation of the valuable minerals from the gangue is accomplished by

a) concentration
b) sorting
c) comminution
d) oxidation

3. A separation dependent on optical and radioactive properties is called

a) froth floatation
b) sorting
c) gangue clearance
d) crushing

4. It is one of the most important methods of concentration effected by the degree of affinity of the minerals for rising air-bubbles within the agitated pulp. This is known as

a) froth floatation
b) sorting
c) magnetic separation
d) refraction

5. A method of separation dependent on electrical conductivity properties is called

a) universal separation
b) high tension separation
c) leaching
d) gravity separation

6. Which of the following bacterium is used to enhance the rate of bacterial oxidation to liberating the occluded gold for subsequent removal by cyanide leaching?

a) flocculation
b) agglomeration

c) thiobacillus ferrooxidans
d) bacillus cokki

7. Besides high energy costs, it is also a great loss in comminution of extremely fine mineral dissemination

a) deterioration in quality
b) long process
c) high losses to tailings
d) difficulty in conglomeration

8. The particles of locked mineral and gangue are known as

a) concentrate
b) middlings
c) tailings
d) grindings

9. The percentage of the mineral occurring as free particles in the ore in relation to the total content is known as

a) degree of freedom
b) degree of bondage
c) degree of liberation
d) degree of integration

10. The ratio of the weight of the feed to the weight of the concentrates is called

a) recovery ratio
b) ratio of concentration
c) enrichment ratio
d) smelting ratio

11. It is the ratio of grade of the concentrate to grade of the feed and related to the efficiency of the process

a) enrichment ratio
b) recovery ratio
c) stokes ratio
d) mass balancing ratio

12. The fine product from classification is known as

a) slimes
b) slack
c) tramp
d) pulp

13. This is one of the cheapest and rapid sampling methods used to determining moisture percentage

a) assay sampling
b) grab sampling
c) table sampling
d) coning and quartering

14. This is an old Cornish method often used to dividing samples of material and dependent on the skill of the operator and not to be used for accurate sampling

a) Jones riffle
b) coning and quartering
c) XRF analysis
d) on - stream analysis

15. The radiation absorbed by elements of low atomic number is lower than that absorbed by elements of high atomic number. This variation of absorption co-efficient with atomic number can be very well applied to

a) froth floation
b) ash determination
c) carbonization
d) agglomeration

16. If 120 m^3 per hour slurry is fed to a floatation conditioning tank of volume 20 m^3, then find out the retention time (on average) of particles in the tank?

a) 1 min
b) 6 min
c) 10 min
d) 24 min

17. A pulp stream is diverted to fill up a can and the pulp density is measured to be as 1450 kg/m^3. Calculate the percentage of solids by weight? Assume the density of solids is 2100 kg / m^3

a) 49%
b) 59%
c) 69%
d) 75%

18. A slurry stream containing quartz is diverted into one litre density can. The time taken to fill up the can is measured as 5 sec. The pulp density is measured to be 1250 kg/m^3. Calculate the mass flow rate of quartz within the slurry. Assuming the density of quartz is 2650 kg/ m^3

a) 228 kg/hr
b) 248 kg/hr
c) 275 kg/hr
d) 288 kg/hr

19. In order to know the continuous recording of tonnage of dry solids passing through the pipe line, the following attachment is provided in many modern plants

a) magnetic flow meter
b) radiation detector
c) sieve bands
d) grizzley

20. The mass flow unit integrates the following things in modern plants

a) size of ore blocks and density of minerals
b) rate of flow and pulp density
c) speed of input parameters and mathematical behaviour of unit processes
d) density of concentration and sensitivity of system

21. In the field of automatic control of mineral processing operation, the output signal is controlled by a standard algorithm known as

a) PID algorithm
b) feed back algorithm
c) EVOP algorithm
d) fuzzy logic algorithm

22. Which is one of the greatest problems in overcoming flotation control to accommodate changes in ore type?

a) to define flexible limits to the maximum and minimum amounts of reagent added
b) to control sustained load changes deviating from the set-point for long period
c) to know the contents of middling and tailings
d) to optimize the economic based performance criterion

23. The disadvantage of feed back control loops is that they compensate for disturbances in the system only after the disturbances have occurred. This is overcome by

a) adaptive control methods
b) microprocessor based controller
c) feed-forward control method
d) kalman filtering method

24. It is a simple algorithm used to update the model parameters to give a reasonably accurate prediction of the dynamic behavior of the process

a) recursive least squares estimation
b) evolutionary optimization technique
c) PI control technique
d) data loggers

25. Which of the following expert system has been developed and introduced to achieve high level performance in mineral process control and diagnosis?

a) binary matrix
b) fuzzy logic
c) artificial intelligence
d) numerical modeling

26. A model comprising of the combination of theoretical with empirical is known as

a) computer based model
b) steady state mathematical model
c) phenomenological model
d) comminution model

27. The feed to a flotation plant assays 0.75% Cu. The concentrate produced assays 30% Cu and the tailings 0.2%. Calculate the ratio of concentration?

a) 52 b) 53
c) 54 d) 55

28. The feed to a flotation plant assays 0.75% Cu. The concentrate produced assays 30% Cu and the tailings 0.2%. Find out the enrichment ratio of the concentrate?

a) 25 b) 30
c) 35 d) 40

29. The feed of a floatation plant assays 0.7% gold. The concentrate produced assays 30% gold and the tailings 0.15% gold. Calculate the recovery of gold to the concentrate?

a) 75 b) 77
c) 79 d) 81

30. A mineral processing plant treating almost 10,000 ton of ore per day requires water almost

a) 5 m^3/min b) 10 m^3/min
c) 15 m^3/min d) 20 m^3/min

31. Consider a hydro cyclone fed with a slurry containing f% solids by weight producing an under flow and over flow containing u% and v% respectively. If the weight of the solids per unit time in the feed, underflow, overflow are F, U, V respectively then under equilibrium condition which of the following is true? Assume dilution ratio of feed, underflow and over flow are f', u', v' respectively?

a) $F / f' = U / u' + V / v'$
b) $F f' = U u' + V u'$

c) F / UV– = f′ / u′ √′
d) FUV / f′ u′ √′

32. The connection-matrix has how many columns?

a) 4 b) 6
c) 9 d) 11

33. How will you quote the size of an irregular particle using a single quantity?

a) length
b) width
c) perimeter
d) equivalent diameter

34. How can you measure the Stoke's diameter?

a) microscopically
b) sieving
c) sedimentation and elutriation technique
d) granular technique

35. How can you measure the projected area diameter?

a) coning & quartering
b) sieving
c) acicular
d) microscopically

36. Which of the following is the widely used method for particle size analysis?

a) test sieving
b) grinding
c) elutriation
d) sedimentation

37. Which of the following is the standard series of aperture of consecutive sieves and for most purposes are quite adequate?

a) $\sqrt{2}$
b) $3\sqrt{2}$
c) $4\sqrt{2}$
d) $5\sqrt{2}$

38. How will you chose the sieve range?

a) no more than 5% of sample is retained on the coarsest sieve
b) no more than 15% of sample is retained on the coarsest sieve
c) sieve ranges can be chosen randomly
d) such that centres at the apices of round holes should be at isosceles triangle

39. The general procedure for test sieving are comprehensively covered in

a) BS 1967
b) BS 1796
c) BS 1896
d) BS 2001

40. The cumulative percentage of passing through the sieves of the material less than 125 μm in size is

a) 99.9 b) 97
c) 87.5 d) 36.9

41. Selection of crusher is done on the basis of particle

a) shape
b) specific gravity
c) size
d) percentage of metal in ore

42. Reduction ratio increases with

a) smaller size of crusher
b) larger size of crusher
c) size of ore as input
d) size is immaterial

43. Griffith's principle is based upon

a) floatation
b) classification
c) comminution
d) separation

44. Jaw crushers are classified according to the basis of

a) throw point
b) pitman
c) pivot point
d) input point

45. Set of a Jaw crusher dictates on

a) feed size
b) resistance time
c) flocculation time
d) discharge size

46. Jaws of crushers are constructed from

a) plastic
b) ceramics
c) alloy cast steel
d) pvc material

47. The spindle of gyratory crusher rotates normally at the speed of

a) 10-15 rpm
b) 40-60 rpm
c) 85-150 rpm
d) 300-500 rpm

48. This is one of the most common methods often used to presenting the results of sieve analyses performed on material which has been ground to ball mills

a) Log-Log method
b) Rosin-Remmler method
c) Power model
d) Renner and Cohen method

49. Who has studied and assessed the two methods namely rosin-rammler and gates-gaudin-schumann and suggested that the latter is better method for mineral processing application?

a) Harris
b) Allen
c) Renner
d) Mozley

50. In which of the following method, cumulative under size data are plotted against sieve aperture?

a) Renner and Cohen method
b) Gates-Gaudin-Sschumann
c) Taggart
d) Fontein

51. What advantage you will get if it is known that data obtained from the material usually yields a straight line point?

a) it shows highly skewed distribution
b) burden on routine analysis would be less and relatively few sieves will be needed to check the features of size distribution
c) the linear ordinates avoids significant percentage oversize or undersize
d) this is the only numerical parameter that helps visualizing the relative frequency of occurrence of various sizes present in the material

52. Sieving is rarely carried out on a routine basis for particle size below 40 μm. Which operation is followed for particle size below 40 μm?

a) sub-sieving
b) regulating
c) drew boy bathing
d) centrifuging

53. Which of the following is the approximate conversion factor for sieve size to Stoke's diameter in sedimentation, elutriation procedures?

a) 0.75
b) 0.84
c) 0.94
d) 1.34

54. Which of the following is the approximate conversion factor for sieve size to projected diameter in microscopic procedure?

a) 0.44
b) 0.84
c) 0.94
d) 1.4

55. Name the technique where samples are sized by allowing the dispersed material to settle against a rising fluid velocity?

a) elutriation
b) sedimentation
c) microscopic
d) terminal

56. Both sedimentation and elutriation techniques separates particles on the basis of

a) viscosity
b) resistance to motion
c) fluid density
d) grinding speed

57. Which of the following is the Stoke's equation for the derivation of terminal velocity of particles?

a) $F f' = U u' + V u'$
b) $R = vdDf / \eta$
c) $v = d^2 g (D_s - D_f) / 18 \eta$
d) $h/v = d_2 / d_2 - d_1^2$

58. Stoke's law is only derived for

a) spherical particles
b) non-spherical particles
c) non-viscous flow region
d) settling time

59. For a known particle and fluid density, fluid viscosity, if the value of terminal velocity is substituted in Stoke's equation then we get

a) Reynolds number
b) sedimentation diameter
c) aperture ratio
d) decantation number

60. Which of the following statement regarding Stokes law is true?

a) Stokes law is only valid for the region of non-viscous flow
b) Stokes law is hold good for all particles below 40 μm

c) Stokes law is hold good for all particles above 40 μm
d) Stokes law is only valid for non-spherical particles

61. Sedimentation diameter is the alternative name of

a) Stoke's equivalent spherical diameter
b) Andreasen pipette diameter
c) Cyclosizer diameter
d) Coulter counter

62. Sedimentation method is well illustrated by

a) elutriation method
b) Andreasen technique
c) beaker decantation
d) electrical resistance method

63. Sedimentation method is based on

a) particle sizing by means of an upward current fluid
b) change in volume of fluid
c) measurement of the rate of settling of powder particles uniformly dispersed in a fluid
d) individual measurement of particles

64. Name a quicker and less tedious method sedimentation analysis out of the methods/techniques as mentioned below?

a) simple elutriator
b) Warman cyclosizer
c) Andreasen pipette
d) Coulter counter

65. How long the process of elutriation will be carried out?

a) till the material particles are settled
b) as long as the material powder is uniformly dispersed in the fluid
c) until there are no visible signs of further classification or the rate of change in weights of the products is negligible
d) until the finer particles are agglomerated in the suspended fluid

66. Normally how many cyclones are arranged in series within the unit of cyclosizer?

a) 3 b) 4
c) 5 d) 9

67. How are the cyclones in the unit of cyclosizer arranged?

a) such that the discharges are effectively kept open
b) such that the overflow of one unit is the feed to the next unit

c) such that the tangential entry into the cyclones induces the liquid not to spin
d) such that the liquid with all settling particles is discharged through the vortex

68. Which of the following method makes use of current changes in an electrical circuit and become popular in certain applications of size analyzer ranging from 0.5-400 μm.

a) Laser beam particle size analyzer
b) on-line particle size analyzer
c) Coulter counter analyzer
d) Warman cyclosizer

69. The laser beam particle size analysis is suitably applicable for particle size measurement of

a) powdered products b) 8 – 25 μm
c) 26 – 50 μm d) > 50 μm

70. In spite of too many attractive advantages, one of the following particle size analyzer is not so popular due to its high capital cost?

a) laser beam particle size analyzer
b) on-line particle size analyzer
c) coulter counter analyzer
d) microscopic sizing

71. Which is the main limitation to the accuracy of all size analyzing devices is

a) simplicity of use
b) size segregated slurry emerging from the classifying helix
c) sensitivity to changes in pulp density
d) effect of solids concentration to the absorption of ultrasonic radiation

72. This is the method in which the particle size of the ore is progressively reduced until the clean particles of mineral can be separated?

a) crushing
b) tumbling
c) comminution
d) grinding

73. Comminution in the mineral processing plant takes place as a sequence of

a) sorting and grinding
b) grinding and crushing
c) crushing and grinding
d) froth floatation and mineral concentration

74. Besides water, the energy required for comminution is further reduced by

a) using corrugated crushing surfaces
b) chemical additives
c) increasing the level of bondage in particles
d) increasing stress to the square root of the crack length perpendicular to stress direction

75. One of the greatest problem lies in comminution is

a) the surface area of known particles of uniform diameter is inversely proportional to the diameter
b) the probability of breakage in comminution is high for large particles and rapidly diminishes for fine sizes
c) differences exist in the breakage characteristics depending on variations in the work index
d) that most of the energy input is absorbed by the machine itself and only a fraction is available for breaking the material

76. According to Kick's law, the energy required for comminution is proportional to

a) log R/log f
b) log R/log p
c) log P/log R
d) log to log R/log 2

77. It is the parameter that expresses the resistance of the material to crushing and grinding and numerically expressed as Kwhr per short ton

a) reduction ratio
b) work index
c) grindability
d) gangue liberation ability

78. If the bond work index for quartz is 13.57 what is the same for graphite?

a) 9.58 b) 19.58
c) 23.56 d) 43.56

79. Blake and Dodge are the types of which crusher?

a) Gyratory
b) Cone
c) Jaw
d) Roll

80. The distinctive feature of Jaw crushers is

a) the two plates open and shut like animal jaws
b) the jaws are set at an obtuse angle to each other
c) the speed of jaw crushers varies directly proportional to the size
d) the maximum amplitude of swing of the jaw or throw is determined by the shape of material being crushed

81. Which crusher is to be recommended for use where the crusher gape is more important than the capacity?

a) gyratory crusher
b) cone crusher
c) jaw crusher
d) ball mill

82. Given below is the volumetric capacity deriving formula of a crusher. The formula is expressed for which type of crusher?

a) cone crusher
b) roll crusher
c) gyratory
d) jaw

83. One of the following crusher is suitable for hard, abrasive material tending to give more cubic product if the feed is laminated or slabby

a) ball mill
b) roll crusher
c) gyratory
d) jaw crusher

84. What is the maximum feed size in secondary crusher?

a) 5 cm b) 15 cm
c) 30 cm d) > 60 cm

85. The throw of cone crusher is A times that of primary crusher? A is given by

a) 5 b) 7
c) 10 d) 12

86. Why the capital cost of roll crusher is the highest of all crushers?

a) it has very large rolls in relation to the feed size of particles
b) it has a number of horizontal cylinders revolving towards each other
c) it is gear driven and crushing process is limited to one single pressure
d) the modern rolls are driven by V-belts from separate motors

87. Which of the following equation can be used to determine the maximum size of rock gripped in relation to roll diameter and the reduction ratio required?

a) $\mu_k = [(1 + 1.12\ v) \div (1 + 6v)]\ \mu$
b) $\text{Cos}\ \theta/2 = (R + a) \div (R + r)$
c) $C\ \text{Sin}\ \theta/2 = \mu\ C\ \text{Cos}\ \theta/2$
d) $Q = BSs\ .\ \text{cot}\ [\ a\ .\ k\ .\ 60n\ ]\ m^3 / hr$

88. What will be the theoretical capacity of a roll crusher if the speed of rolls is 5 revolution per minute, roll diameter is 1000 mm, roll width 1.2 m, specific gravity of feed material is 2.5 kg / m^3 and distance between rolls be 0.6 m?

a) 1296 kg
b) 1496 kg
c) 1596 kg
d) 1696 kg

89. In practice what is the tentative capacity of rolls in India?

a) 10 % of theoretical
b) 18 % of theoretical
c) 25 % of theoretical
d) 60 % of theoretical

90. Grinding within a tumbling mill is not influenced by

a) size
b) quantity
c) shape
d) type of motion

91. A ball mill is rotating at critical speed (i.e. the medium abandons its circular path at the highest vertical point where Cos α = 1) having radius of 4 m. Find out its revolution per minute?

a) 13
b) 15
c) 18
d) 21

92. This is the simple type of feeder supported independently of the mill having cylindrical or elliptical chute where material is fed by gravity. Name the feeder

a) spout feeder
b) drum feeder
c) drum-scoop feeder
d) scoop feeder

93. Which of the following rod mill is widely used in mining industry with the principal function is to convert crushing-plant product into ball mill feed introduced through one trunnion and discharges through the other?

a) central peripheral discharge mill
b) end peripheral discharge mill

c) overflow mill
d) hardinge mill

94. Which of the following screening is suitable if efficiency is the only criterion?

a) dry screening
b) wet screening
c) damp screening
d) screening of the material having moisture and clay

95. Which of the following has very important role in reducing the screen performance?

a) nature of feed material
b) presence of moisture in the feed
c) presence of clay materials in the feed
d) presence of particles close the aperture size

96. Hammer mill is a type of

a) high speed crusher
b) cone crusher
c) impact crusher
d) roll crusher

97. Duopactor is a kind of

a) jaw crusher
b) ball mill
c) gyratory crusher
d) impact crusher

98. When a solid particle falls freely in a viscous medium such as air or water, there is a resistance to this movement and constant acceleration is lost rather the value increases with velocity. When equilibrium is attained between the gravitational and fluid resistance forces, the body reaches its

a) critical velocity
b) terminal velocity
c) free settling velocity
d) hindered velocity

99. If the two particles have the same density but different diameter then which of the following is true?

a) particle with smaller diameter has the higher terminal velocity
b) particle with larger diameter has the higher terminal velocity
c) particle with smaller diameter has the lesser terminal velocity
d) particle with larger diameter has the lesser terminal velocity

100. Mechanical classifier is a type of

a) hydrocyclone
b) vertical current classifier
c) horizontal current classifier
d) multi-spigot hydrosizer

101. Which of the following utilizes the method of gravity concentration?

a) froth floatation
b) jigging
c) spiral classifier
d) duopactor

102. Which of the following properties are utilized in froth floatation?

a) Specific gravity
b) viscosity
c) differences in physico-chemical surface properties
d) particle temperature

103. What is a main characteristic followed in froth floatation technique?

a) to create difference in temperature
b) to create difference in density
c) to render the particles hydrophobic and facilitating bubble attachment
d) deactivate the mineral to bubble attachment and not to control the pH of the system

104. Which of the following properties are to be imparted to most minerals in order to float them?

a) porosity
b) hydro
c) sulphidized
d) polarized

105. Which of the following property of frothing action is very useful in froth floatation technique?

a) frothers should not be soluble in water
b) frothers would be distributed very unevenly in an aqueous solution
c) frothers with amino group and sulpho group is preferred
d) frothers should have the ability to adsorb on the air-water interface to reducing surface tension and stabilizing air-bubble

106. Indian coal is difficult to wash due to presence of

a) high ash percentage
b) high near gravity material
c) high moisture percentage
d) high volatile matter

Answers

1. a	**2.** c	3. b	4. a	5. b	6. **c**	**7.** c	8. b
9. c	**10.** b	11. a	12. a	13. b	14. **b**	**15.** b	16. c
17. b	**18.** d	19. a	20. b	21. a	22. **a**	**23.** c	24. a
25. b	**26.** c	27. c	28. d	29. c	30. **d**	**31.** b	32. d
33. d	**34.** c	35. d	36. a	37. a	38. **a**	**39.** b	40. c
41. c	**42.** a	43. c	44. c	45. d	46. **c**	**47.** c	48. b
49. a	**50.** b	51. b	52. a	53. c	54. **d**	**55.** a	56. b
57. c	**58.** a	59. b	60. b	61. a	62. **c**	**63.** c	64. c
65. c	**66.** c	67. b	68. c	69. a	70. **a**	**71.** c	72. c
73. c	**74.** b	75. d	76. d	77. b	78. **d**	**79.** c	80. a
81. c	**82.** d	83. c	84. b	85. a	86. **a**	**87.** b	88. d
89. c	**90.** c	91. b	92. a	93. c	94. **b**	**95.** d	96. c
97. d	**98.** b	99. b	100. c	101. b	102. **c**	**103.** c	104. b
105. d	**106.** b						

CHAPTER - 10

MINING AND INDUSTRIAL MANAGEMENT

1. **The professional discipline and business function that oversees an organization's human resources is called**
   a) personal management
   b) human factor management
   c) human resource management
   d) business management

2. **What do you understand by the term market is "tight"**
   a) not a good liaison with employees
   b) integrity of people within the organization is not good
   c) transactional administration is not dominating
   d) not enough opportunity for jobs

3. **Which of the following attributes is not desirable for an organization developing as good in the market**
   a) flexibility b) work centralization
   c) appropriate levels of control d) grant of authority

4. **What is the full form of HWWE?**
   a) humanizing work and work environment
   b) harmonizing work and workers in employment
   c) hard work and work efficiency
   d) hazardous work and work environment

5. **Which of the following do not fall under "external factors" affecting human driven organization?**
   a) statutory regulations, rules and regulatory framework
   b) trade union intervention
   c) behavior of senior management people
   d) social pressure

6. **According to Koontz and O'Donnell, it is the art of including the subordinates to accomplish their assignments with zeal and confidence**
   a) motivation b) facilitator c) centralization d) leadership

7. **It is such a behavior where the leader is very open minded and has mixing character**
   a) paternalistic behaviour
   b) democratic behavior

   c) autocratic behavior
   d) laissez faire behavior

8. **In order to understand complexity of worker, the management experts have developed several models. Out of which Edgar H Schein developed concepts on motivation of people. Name the model.**
   a) situational model
   b) behavioural model
   c) trait model
   d) democratic model

9. **It is the study originated by M E Mundel where motion pictures are taken at slow speeds**
   a) memomotion study
   b) micromotion study
   c) value engineering study
   d) motion video study

10. **It is the activity that cannot be performed until the predecessor event has occurred. Identify it**
    a) PERT activity b) CPM activity
    c) optimistic activity d) fast tracking activity

11. **Activities that can be delayed without making the project longer**
    a) critical b) flexibility c) total float d) network activity

12. **Which of the following analysis is mostly used for inventory control**
    a) lead time analysis b) PERT analysis
    c) CPM analysis d) ABC analysis

13. **It is one of the capital budgeting decision making rules that represents amount of time that it takes for a project to recover its initial cost**
    a) net present value
    b) payback period
    c) internal rate of return
    d) cash flow period

14. **It is one of the capital budgeting project indicating the discount rate at which net present value of a project becomes zero**
    a) IRR b) CCF c) CFT d) ERP

15. **Facilitating flow of information between all business functions inside the boundaries of the organization and managing connections to outside stakeholders. Which of the following can explain this?**

a) job evaluation technique
b) enterprise resource planning
c) break even analysis
d) management information system

16. What can be calculated by using the following relation ship

$$\frac{f}{1-\frac{V}{P}}$$

F F is the fixed cost;
V V is variable cost/unit
P P is selling price of each unit

a) order of importance b) breakeven point
c) ranking preference d) finding dividends

17. Which of the following costs are used in determining price of the products, accepting an offer or in decision making on replacing machinery etc?

a) differential cost b) marginal cost
c) incremental cost d) standard cost

18. Soluble organisms represented by high "A" waste causes depletion of O_2 in the surface water that results in fish kills and undesirable changes in aquatic life. A is given by

a) BOD b) toxic c) mineral effluents d) loss of bio-diversity

19. In 1990 clean air act, the air toxic category includes A number of specific chemicals having relevance in air quality impact study. A is given by

a) 185 b) 187 c) 189 d) 191

20. In order to save mining environment no plant for screening or sorting of coal, no heap of cinder, cement, sand is allowed to be placed within— m of the top of DC shaft or intake airway.

a) 40 m b) 60 m c) 80 m d) 120 m

21. Who advocated the novel concept of net national welfare (NNW)?

a) Barrett b) O'Riordan c) Munn d) Shigarotsuru

22. Gross domestic happiness (GDH) refers to which index?

a) index of market price b) index of poverty
c) index of progress d) index of literacy

23. Which Govt has introduced the GDH index?

a) Sikim b)Assam c) Jharkhand d) Bhutan

24. Who has given the concept that loss accruing from accident, pollution, deterioration of values of life is to be estimated?

a) Prof. Shigarotsuru b) Dr. Heather Ucgynski
c) Alan Stoneman d) McAllister

25. As per MCDR 1988 the removed top soil shall be kept separately and utilized for the purpose of

a) prospecting of land
b) restoration and rehabilitation
c) protection of flora and fauna
d) prevent tailings disposal

26. Disturbance and displacement of fauna is mainly caused by

a) noise b) air contamination
c) silting and reagents d) acid drainage

27. Which of the following action minimizes the negative impacts of mining industry?

a) internal monitoring
b) compensation payment
c) rehabilitation and resettlement policy
d) infrastructural activities

28. Restoration, reclamation and rehabilitation of land shall be completed

a) after abandoning the mine
b) before abandoning the mine
c) before handing over to NGO's
d) prior to opening up a new mine

29. Due to which of the following operation, road, railway lines even townships are disturbed and some of these facilities are to be shifted causing problems to man?

a) extensive mining b) unorganized mining activity
c) acid mine drainage d) subsidence

30. The impact of this environmental component is on the ecosystem comprising both flora and fauna. What is that component?

a) biota b) animal excreta
c) mine tailings d) heavy metals

31. What is the full form of TOC?

a) total oxygen consumed
b) toxicity of carbon

c) total organic carbon
d) turbidity oil content

32. Which of the following is known as "effluent polishing"?

a) it is to settle out biological flock through a secondary classifier
b) it is to provide final treatment stage to raise effluent quality before discharged where disinfection is practiced.
c) it is the final treatment stage of treatment to raise effluent quality where disinfection is not practiced.
d) it is the effluent treatment done with ultraviolet.

33. With the help of soil bio-technology (SBT) process, the level of COD can be brought down to as minimum as "A" mg/L from sewerage input of COD 400 mg/L. A is given by

a) 10 mg/L b) 20 mg/L c) 40 mg/L d) 60 mg/L

34. Which of the following is not used as common method of disinfection?

a) ozone b) chlorine
c) sodium hypochlorite d) chloramines

35. It is one of such infection treatment of waste water that is practiced in North America having a disadvantage of generating an organic compound that may be carcinogenic or harmful to the environment. Identify it.

a) secondary sedimentation b) radiation
c) chlorination d) filter clogging

36. "MBBR" typically requires smaller foot print in the sewerage process. What is the full form of MBBR?

a) membrane of bio basin reactors
b) moving bed biofilm reactors
c) manure bedded biological rate
d) medium biomass brine reagent

37. It is a top down deductive failure analysis where undesired state of a system is analysed using Boolean logic to combine series of lower level events

a) hazard analysis b) cognitive analysis
c) fuggy logic analysis d) fault tree analysis

38. In mining, manager, asst manager, supervisors should have proper understanding of technology related to statutory obligations to avoid which of the following conflict?

a) cognitive conflict b) interest conflict
c) values conflict d) relationship conflict

39. Which Scientist prefers "division of work" as one of his 14 management principle?

a) Henri Fayol b) F W Taylor
c) Henry Gantt d) Gilbreth

40. It is one of the commercial process that can make quicker deliveries to customers having very good impact on business health?

a) technology outsourcing
b) strategic management
c) business outsourcing
d) business streamlining

41. It is the group who develops mine map layers and digitizes associated mine map layers for all project areas

a) GC b) HDI c) SIA d) GRG

42. It is the model helps to understand behavior and structure of terrain indicating flow of water to decide escape route during mine inundation

a) MIS b) GC c) DEM d) GPS

43. It is a versatile computer based system having wide spread application in the analysis of stochastic system that are too complex to be presented by mathematical formula.

a) neural network b) system simulation
c) graphic console d) operations research

44. It is the science to determine workload w.r.t anthropometric dimension of human.

a) psychology b) ergonomics
c) sociology d) anthropology

45. With —the organization can experience increased efficiency, productivity while problems of management is reduced to a great extent. Fill up the blank with suitable word.

a) information technology b) strategies
c) professional attitude d) outsourcing

46. Which of the following index can provide a relatively simple means of monitoring overall level of socio-economic development?

a) human development index (HDI)
b) HAZOP index
c) CSR index
d) health monitoring index (HMI)

47. HDI combines three factors where life expectancy and income are the two which one of the following is the third?

a) education b) housing
c) health d) literacy

48. The basic impact area, associated with predicting and assessing impacts on the socio-economic environment is called

a) region of influence
b) triple bottom line
c) communication on progress
d) socio-cultural impact

49. Health impact assessment (HIA) is undertaken by a specialist consultant and the output is known as

a) pre-feasibility study b) scoping
c) health impact assessment d) health hazard identification

50. It is the overall process of risk analysis and risk evaluation

a) risk management b) risk assessment
c) risk control d) risk rating

51. A structured process composed of well defined system emphasizing continuous improvement in a work quality, health, welfare and productivity known as

a) safety information system
b) risk management
c) safety management system
d) safety audit

52. It is a working document outlining all actions to be carried out to ensure safety and health at work place. Identify from the list below

a) safety management plan b) health impact assessment
c) health review issues d) risk assessment matrix

53. Which of the following is treated as one of the important input of planning and decision making?

a) resource allocation b) scheduling
c) forecasting d) capital budgeting

54. Capacity vulnerability analysis (CVA) framework form a simple matrix constituting three broad areas. If physical/material and social/ organizational are the two then which is the third area?

a) environment/health
b) motivational/attitudinal
c) skill/labour
d) financial/technological

55. What is the full form of IDRM?

a) integrated disaster risk management
b) Indian disaster rate monitoring
c) infrastructure development related management
d) immediate development of rural market

Answers

1. c	2. d	3. b	4. a	5. c	6. d	7. d	8. b
9. a	10. a	11. c	12. d	13. b	14. a	15. b	16. b
17. a	18. a	19. c	20. c	21. d	22. c	23. d	24. a
25. b	26. c	27. c	28. b	29. d	30. a	31. c	32. b
33. a	34. d	35. c	36. b	37. d	38. a	39. a	40. c
41. d	42. c	43. b	44. b	45. d	46. a	47. d	48. a
49. c	50. b	51. c	52. a	53. c	54. b	55.a	

CHAPTER - 1 : Q. 219-260 For Mining Methods

219. The minimum size of barrier in between two panels is

a) equal to width of gallery size
b) equal to dimension of panel
c) equal to pillar size
d) equal to face dimension

220. Water bearance of Indian coal seam is

a) very high **b)** high c) very less d) moderate

221. In degree II gassy seam the rate of gas emission is

a) less than 1 cu.m/ton of coal produced
b) more than 1 cu.m. but less than 5 cu.m
c) more than 1 cu.m. but less than 10 cu.m
d) more than 10 cu.m.

222. "Goaf" in relation to Bord & Pillar or L/W working means a place

a) Coal has been extracted but now not a working place
b) Coal has been extracted but still a working place
c) Coal is about to be extracted
d) People has lawful access

223. Commercial coal reserve is

a) less than geological reserve but more than workable reserve
b) less than workable reserve but more than geological reserve
c) more than geological reserve
d) less than workable reserve

224. In depillaring operation major coal losses are from

a) coal left in underground for unfavourable geological conditions
b) coal left to protect surface features
c) coal loss due to spon. heating
d) coal left as ribs within the pillars

225. Mine life time should be calculated based on

a) geological reserve
b) commercial reserve
c) workable reserve
d) inherent reserve

226. Which of the following method is still followed in maximum number of underground coal mines in India

a) Longwall mining
b) Blasting gallery
c) Highwall mining
d) Bord & Pillar mining

227. Seams with bad roof having strata control problems is suitable for

a) Bord & Pillar mining
b) Blasting gallery
c) Longwall mining
d) Hydraulic mining

228. Optimum rate of stone dusting in underground coal mines is

a) 1 Kg/ton of coal produced b) 2.5 Kg /ton of coal produced
c) 5 Kg /ton of coal produced d) 10 Kg / ton of coal produced

229. Which of the following is most suitable for opening up an underground mine?

a) where demand profile is maximum
b) where rehabilitation is suitable
c) where operating cost is least
d) where equipment procurement is easy

230. Which of the following is most difficult in opening up an opencast mine?

a) land area acquisition and rehabilitation
b) recruitment of manpower
c) green belt vegetation
d) selection of customer

231. Adit is adopted for

a) a deposit having less depth of cover
b) hilly terrain
c) a deposit having more depth of cover
d) quick return on investment

232. It is a solid block of coal surrounded on all its side by galleries. Identify it

a) coal face b) coal roof
c) coal pillar d) coal floor

233. Barrier in between panels is preferably punctured at "A" number of places. A is given by

a) 1 b) 2 c) 3 d) any number

234. Panel barrier is punctured for

a) district transport layout
b) district return
c) pumping water out of the panel
d) to take out miners

235. Which of the following is mainly considered for deciding size of panel in depillaring operation

a) volatile content of seam
b) geological considerations
c) support system approved
d) incubation period

236. Size of pillars is decided based on

a) nature of roof and floor
b) time dependent strain
c) depth from surface
d) coal strength

237. Who out of the following is not an official but a competent person?

a) overman b) mining sirdar
c) shotfirer d) undermanager

238. Who out of the following is duly appointed in writing by the Manager as competent person to supervise the operation, plant or equipment?

a) shotfirer b) surveyor
c) ventilation officer d) safety officer

239. In an underground mine output from the panel is 360 tpd, having 26 days of working in a month where incubation period of coal is 9 month. If recovery from the panel is 80% and pillar size is 30m x 30m, height 3m, coal sp. gravity 1.8 then find out number of pillars in the panel.

a) 18 b) 22 c) 26 d) 30

240. Sectionalization of work in Bord and Pillar method has been stipulated in which of the following statutes?

a) CMR 116A & Circular 5/2002
b) CMR 117 & Circular 6/2002
c) CMR 118A & Circular 5/1972
c) CMR 122 & Circular 6/1972

241. Which of the following type of SDB is placed outbye of the face?

a) heavy barriers b) light barriers
c) intermediate barriers d) any kind of barriers

242. Provision of SDB has been given in which of the following circular?

a) 3/1975 b) 4/1975 c) 5/1975 d) 6/1975

243. Which of the following statement is true for panel system of working?

a) control of subsidence is difficult and crushing of pillars happens frequently
b) chances for spon heating is maximum resulting in closure of mines
c) it has independent transport, ventilation and loading system
d) crushing of barriers may result in joining of 2 faces

244. To estimate appropriate air requirement in underground mine which of the following is true?

a) exact manpower employed in the district
b) exact daily tonne output
c) size of the mine
d) persons employed in the district and daily tonne output

245. In coal seam having prominent cleavages or geological disturbances, the intake and return airways shall be as far as away which is equal to

a) one pillar length b) two pillars length
c) 180m apart d) 360m apart

246. Which of the following has direct impact on the turnout of face loading machine?

a) solid blasting technique
b) pillar size
c) lead distance
d) pull

247. Maximum number of faces possible in a 6 heading B & P district is

a) 12 b) 14 c) 16 d) 20

248. Which of the following faces are not permitted to run in B & P district?

a) rise face in the top most heading
b) rise face of top heading and dip face of bottom most heading
c) dip face of any heading
d) any rise face

249. Which of the following credential is required for getting mining block in India?

a) 10% financial credential & 90% technical credential
b) 25% financial credential & 75% technical credential
c) 50% financial credential & 50% technical credential
d) 75% financial credential & 25% technical credential

250. Which of the following support has maximum linear progress?

a) timber prop b) square chock c) roof bolt d) friction prop

251. Six 100w bulbs at a distance of 6m gives a lighting of

a) 0.5 lumen/ft^2 **b)** 1 lumen/ft^2
c) 1.5 lumen/ft^2 **d)** 3 lumen/ft^2

252. What is the standard of lighting at pit bottom of Indian mines?

a) 0.4 lumen/ft^2 **b)** 1.25 lumen/ft^2
c) 2 lumen/ft^2 **d)** 3 lumen/ft^2

253. What is the standard of lighting required for the workplace of HEMM's of opencast mine?

a) 2 lux b) 3 lux c) 4 lux d) 5 lux

254. A lease holder cannot abandon a mine or part unless

a) form C & D is submitted to Regional Controller of Mines
b) final mine closure plan is submitted and approved by Regional Controller of mines
c) progressive mine closure is submitted to controller general
d) up to date mine plan is submitted to DGMS

255. Risk of premature collapse and over-ridding of pillars are maximum with

a) shortwall method
b) longwall
c) bord and pillar
d) sub-level caving

256. In which of the following thick seam mining method, roof sag and initiation of spon heating is maximum seen?

a) descending slicing
b) ascending slicing
c) mixed order of slicing
d) under winning integral method

257. Where seam thickness is more than 8m and regular, dip < 60^0, roof & floor is strong and coal is not liable to spon heating with easily cavable roof. Which of the following method is suitable?

a) inclined ascending slicing
b) horizontal slicing
c) diagonal slicing
d) transverse slicing in descending order

258. Which of the following thick seam methods can be suitably applied for a deposit of any shape containing both hard and weak coals, self igniting and emitting firedamp where stability of wall rocks is of no importance

a) blasting gallery b) inclined slicing
c) horizontal slicing d) sub-level caving

259. In gassy mine being worked by soutirage method which of the following method of blasting is preferred?

a) solid blasting b) cone blasting
c) camouflage blasting d) coromant cut blasting

260. Which of the following combination of SDL based mining is expected to give best production and productivity of SDL?

a) 3 level heading district b) 4 level heading district
c) 5 level heading district d) 6 level heading district

Answers

219. c	220. d	221. c	222. a	223. d	224. d	225. b	226. d
227. c	228. b	229. c	230. a	231. b	232. c	233. a	234. b
235. d	236. c	237. c	238. a	239. b	240. c	241. a	242. d
243. c	244. d	245. b	246. c	247. c	248. b	249. b	250. c
251. c	252. d	253. d	254. b	255. c	256. b	257. a	258. c
259. c	260. c						

CHAPTER - 2 : Q. 136-150 For Mine Environment

136. It plays an important role in human tolerance of high wet bulb temperature

a) acclimatization b)saturation c) asphyxia d) radiation

137. Kata thermometer is used to learn

a) wet bulb temperature
b) dry bulb temperature
c) cooling time
d) heat convection

138. This is the temperature developed by Yaglou to combine DB, WB, air velocity to a thermo-equivalent condition of still, saturated air

a) globe temperature
b) effective temperature
c) room temperature
d) deep body temperature

139. It is a physiological index of comfort under certain environment developed by medical research council of Britain

a) cooling power b) P4SR c) WBGT d) cooling load

140. This is a British instrument that works on tyndall effect and comprises of a collimated beam of near-infra red light passing through a dust chamber. Identify the instrument

a) tyndalloscope
b) simslin
c) holographic counter
d) royco particle counter

141. Which of the following instrument is preferably used for counting and size analysis of a suspended cloud of aerosols

a) gravimetric dust sampler
b) tyndalloscope
c) holographic system
d) dust settling ionizers

142. Which of the following drilling causes less bit wear

a) wet drilling b) dry drilling
c) holman wet drilling
d) konningsborn drilling with water flushing

143. A wet drilling at a drift produces dust concentration of 450 ppcc in the respirable size range while dust concentration rises to 750 ppcc if drilling is done dry. Calculate the amount of respirable size produced per minute in either case if the drift face is ventilated by a tube delivering 3 m^3 per sec of fresh air. Calculate the efficiency of dust suppression by wet drilling.

a) 6.1×10^{10} (wet), 11.5×10^{10} (dry), 30%
b) 7.1×10^{10} (wet), 12.5×10^{10} (dry), 20%
c) 8.1×10^{10} (wet), 13.5×10^{10} (dry), 40%
d) 9.1×10^{10} (wet), 14.5×10^{10} (dry), 50%

144. For gravitational settling of dust laden air in a settling chamber where dust settles down by gravity, which of the following relation for retention time (t) in chamber satisfy the equation

a) t = Q/lhb b) t = lb/Qh c) t = lhb/Q d) t = hl/Qb, where

l =length of chamber; h = height of settling chamber; b = breadth of chamber; Q = quantity of air flowing

145. If velocity of air in a settling chamber is 0.3 m/s, terminal velocity of the particle is 0.19 m/s then find out h/l ratio of the chamber assuming eddy factor 0.5

a) 0.316 b) 0.416 c) 0.516 d) 0.616

146. Which of the following refrigerant is used as coolant in KGF reef champion mine?

a) CH_4 b) $CaCl_2$ c) CCl_2F_2 d) NH_3

147. It is often expressed in refrigeration tonne (Rt) which is equal to a rate of heat removal of "A" Kw. A is given by

a) 2.5 Kw b) 3.5 Kw c) 5.5 Kw d) 10.5 Kw

148. It has a large latent heat of evaporation, evaporates and condenses nearly at atmospheric temperature and pressure. Identify it

a) refrigerant
b) centrifugal compressor
c) brine water
d) sodium chloride solutions

149. It is the equation which gives the estimate of the pressure drop for laminar flow of viscous fluids through pipes. Name the equation

a) kinematic viscosity equation
b) poiseuille equation
c) barnoullis equation
d) karman resistance equation

150. It is the ratio of the power actually absorbed by the impeller and converted into the head of the power applied to the shaft

a) volumetric efficiency
b) static efficiency
c) total efficiency
d) mechanical efficiency

Answers

136. a	137. c	138. b	139. b	140. b	141. c	142. b	143. c
144. c	145. a	146. c	147. b	148. a	149. b	150. d	

CHAPTER - 3 : Q. 133-150 For Mining Machinery

133. What is the main purpose of jazz rail on underground haulage track?

a) to provide smooth running of tubs
b) to avoid derailment of tubs
c) to avoid over speeding
d) to maintain good alignment of track

134. Which of the following seems to be the better location of installing drop-war-wick?

a) at mine entrance
b) at district entrance
c) at places where inclination is very high
d) just above maindip

135. Why IWRC rope has more load bearing capacity than flat rope?

a) it has independent wire rope in the core making it stronger
b) lubrication can be done from outside making it suitable for operating high load
c) outer wires are more strong and stable than flat rope
d) kinks cannot take place on these ropes

136. In which way sequence control operation is useful for belt conveyor?

a) interruptions in conveying gets reduced
b) if an outbye conveyor stops then other conveyor will also stop diminishing chances of coal heap at tail end.
c) it improves the life of conveyor thereby reducing the running cost
d) it acts as shock absorbing operation

137. Which of the following action is observed in shaker conveyor?

a) frictional motion
b) cradle movement
c) jigging movement
d) quick forward and slow backward movement

138. Which of the following gear is suitable for cable belt conveyor?

a) differential gear
b) rack and pinion gear
c) bevel gear
d) helical gear

139. How do you achieve "trough shape" in a belt conveyor?

a) woven fabric
b) steel cable layering
c) idler set
d) loop-take-up

140. A conveyor is 600m long carrying coal having bulk density 0.8 t/m^3 up a gradient of 1 in 60 at the rate of 220 t/hr. If the belt width (w) is 0.75m and cross-sectional area of the material is 0.1w^2, determine belt speed?

a) 1.26 m/s b) 1.36 m/s c) 1.86 m/s d) 2.26 m/s

141. Which of the following serves as fire-resistant material in belt conveyor?

a) polymeric compound b) neoprene
c) ammonia d) brine solution

142. It is seen that belt conveyor is snapped during its use. In order to join it some portion of the belt is cut from both end. This is taken from the extra section of belt provided within the conveyor itself. Where this extra part which is about 1 – 1.5% of belt conveyor is provided?

a) driving arrangement
b) steel channel runner
c) tail end
d) loop-take up

143. In endless scraper chain conveyor after every 3 to 4 links there is one very important item is provided. What is that item?

a) flight b) shear pin
c) sprocket d) trough

144. Average loading factor (ALF) of belt conveyor is dependent on which of the following parameter?

a) volume of mineral at face
b) belt speed
c) location of conveyor
d) belt inclination

145. Which of the following has little or no bearing on the carrying capacity (tph) of belt conveyor?

a) belt speed b) mineral size
c) trough angle d) belt width

146. Which of the following has low FOS and not suitable for shock load or too heavy load?

a) SSC b)IWRC c) fibre core d) central core

147. Method of joining two wire ropes permanently without using special fittings or attachments is known as

a) rope splicing b) laying of wires
c) vulcanizing d) pre-stressing

148. Which of the following criteria w.r.t rope is not considered for its removal from service?

a) outer wires becomes loose and kinked
b) outer wires have lost almost 1/3rd of its diameter
c) waviness is observed but rope remains intact
d) FOS becomes low

149. Due to repeated application of stress rope becomes fatigued which can be explained as

a) obscure physical changes
b) attrition and loosening of material from rope surface
c) elastic changes
d) visual abrasive changes

150. Out of two main types of Continuous miner cutter head, one is borer type what is the other?

a) chopper b) ripper
c) spur head d) turret picks

Answers

133. c	134. d	135. a	136. b	137. c	138. a	139. c	140. b
141. b	142. d	143. a	144. c	145. b	146. c	147. a	148. c
149. a	150. b						

CHAPTER - 4 : Q. 188-221 For Mine Legislation and General Safety

188. According to Brouha, indication of fatigue is determined by

a) lower initial recovery of pulse rate
b) higher initial recovery of pulse rate
c) fast return of heart rate towards resting level
d) second and subsequent recovery pulse rate remains at normal level

189. Energy reserve of average man (25 year, 65 Kg, 1.75m ht) is about

a) 5 Kcal **b) 10 Kcal** c) 20 Kcal **d) 25 Kcal**

190. If any work requires 6 Kcal of energy then according to Spitzer what should be percentage rest allowance in 1 hour?

a) 25% **b) 50%** c)75% d) 100%

191. In physical fitness measurement which of the following parameter can be determined through step test protocol?

a) O_2 consumption (lit/min) b) VO_{2max}
c) heart rate d) CO_2 in exhale air

192. "Fitting the task to human" is described by

a) ergonomics b) statistics
c) psychology d) information technology

193. Which of the following is inversely proportional to environmental temperature?

a) barometric pressure b) miners health
c) design appliances d) workload

194. The main focus of ergonomics is

a) work b) man c) posture d) information

195. Workers can carry out prolonged task without experiencing fatigue provided that energy demand of the task does not exceed

a) 50W b) 150 W c) 250 W d) 500 W

196. which of the following energy level is required when body is at rest

a) 10 W b) 20 W c) 40 W d) 80W

197. Ergonomic work place design must satisfy one of the following criteria

a) less stress on employees health b) to enhance workers efficiency
c) to improve job quality d) to maximize production at high risk

198. Risk of heat stroke or heat collapse increases rapidly as deep body temperature rises above

a) 33°C b) 35°C c) 37°C d) 39°C

199. Amount of tolerable heat stress is determined by which of the following?

a) protein **b) carbohydrate** c) BSA **d) Humidity**

200. Workers are not permitted to continue work when their deep body temperature exceeds

a) 35°C **b) 38°C** c) 42°C d) 48°C

201. Limit of continuous work (LCW) is denoted by

a) resting HR + 35 beats b) resting HR+ 72 beats
c) resting HR+ 100 beats d) recovery HR + 120 beats

202. Total calories consumed by any individual is determined by

a) fairday workload
b) maximum aerobic capacity
c) basal + leisure + working calories
d) calories required to keep an individual alive

203. During extraction of coal pillars no splitting or reduction of pillars or heightening of galleries is permitted

a) upto maximum of 4 pillars ahead of the pillar is being extracted
b) upto maximum of 3 pillars ahead of the pillar is being extracted
c) upto maximum of 2 pillars ahead of the pillar is being extracted
d) upto maximum of 1 pillars ahead of the pillar is being extracted

204. Where pillar extraction is about to begin splitting or reduction of pillars or heightening of galleries shall be restricted to

a) maximum 1 pillar b) maximum 2 pillar
c) maximum 3 pillar d) maximum 4 pillar

205. In order to take care of air blast which of the following statement is true?

a) to get for faster rate of production
b) to bring down goaf at regular intervals
c) to reduce pillar size
d) to extract panel barriers first

206. Where voids formed, as a result of extraction are stowed with sand, colliery Manager has to submit which of the following to RI?

a) quantity of sand stowed
b) quantity of coal raised
c) quantity of coal raised and quantity of sand stowed during preceding month
d) quantity of coal raised and quantity of sand stowed during current month

207. Extraction of coal by a method other than Bord & Pillar has been stipulated in

a) CMR 100 b) CMR 100A c) CMR 103 d) CMR 103A

208. No workings shall be made and no work of extraction or reduction of pillars shall be done within "A" m of any railway line or public works. A is given by

a) 15m b) 30m c) 45m **d) 60m**

209. Which of the following limit of work near mine boundaries is permitted under CMR 1957?

a) upto a distance equal to half of the distance specified in column 5 of regulation 99
b) upto 90m of the last face
c) upto a prominent fault plane
d) upto the boundary of neighbouring mine

210. It is mandatory to post approved copy of the SSR at conspicuous places of the mine. Which of the following is not treated as such place?

a) lamp room b) time keeper room
c) haulage engine room d) mine entrance

211. In cross bar support, the side clamps are put in holes of at least A cm deep made in coal pillar side. A is given by

a) 10cm b) 20cm c) 30cm d) 50cm

212. In safari support the minimum number of laggings to be given is decided as

a) 1 for every meter length of the bar
b) 2 for every meter length of the bar
c) 3 for every meter length of the bar
d) Any number for every meter length of the bar

213. In order to avoid dislodgement of support during blasting, DGMS Circular 9/1977 speaks on

a) tightening of roof support
b) maximum possible contact at roof
c) strategically placed cogs
d) pair of cross bar supports

214. Substantial fencing shall be maintained around the excavation formed as a result mining operation which extends within a distance of A m from a public road or building. A is given by

a) 5m b) 15m c) 30m d) 45m

215. Before a mine is abandoned the owner, agent or manager shall cause the top of entrance of every shaft be fenced by which of the following type of permanent structure

a) U_2 type b) G_1 type c) G_2 type d) S_2 type

216. Mining Sirdar is authorized to perform half of the maximum number of shots to be fired by Shotfirer only when

a) the mine is mechanized
b) manual working is being done where workers is < 30
c) manual working is being done where workers is > 30
d) Any number of worker in mechanized mines

217. In accordance with CMR 113, the minimum number of inspection to be done by Mining Sirdar in respect of all roadway and other working places at which persons are engaged and required to access is

a) 1 b) 2 c) 3 d) no such stipulation

218. In second or third degree gassy mine, use of electric welding apparatus is permitted by

a) Colliery Manager
b) Agent
c) Regional Inspector
d) Director (Technical)

219. Inflammable gas shall be deemed to have been found or detected when certain percentage of gas is indicated by lowered flame safety lamp. What is that percentage?

a) 0.5% **b) 0.75%** c) 1.25% d) 3

220. When percentage of inflammable gas falls below 0.6, determination shall be done in

a) once in 7 days b) once in 24 hours
c) once in 15 days d) once in 30 days

221. In which of the following cases Mines Act provision is not applied?

a) depth of excavation is less than 15 cm
b) less than 20 persons are employed on one day
c) depth of excavation is less than 15 cm and at least 20 persons are employed on a day
d) in all cases irrespective of manpower

Answers

188. b	189. d	190. b	191. b	192. a	193. d	194. b	195. c
196. d	197. b	198. d	199. c	200. b	201. a	202. c	203. c
204. d	205. b	206. c	207. b	208. c	209. a	210. c	211. d
212. a	213. c	214. b	215. d	216. b	217. c	218. c	219. c
220. d	221. c						

CHAPTER - 5 : Q. 71-86 For
Rock Mechanics and Roof Supporting

71. Cross-bars or safari supports are set on the side clamps made in both side walls and the minimum depth of such holes is given by

a) 20cm b) 30cm **c)** 40cm d) 50cm

72. In order to maintain contact with the immediate roof, laggings are put with the cross-bars. The norms of putting such laggings is

a) one for every meter length of bar
b) three for every meter length of bar
c) five for every meter length of bar
d) no such stipulation

73. Minimum length of cogging sleepers that is used as members of cog is

a) 0.6m b) 1.2m **c)** 1.8m d) 2.4m

74. When an excavation related to mining operation extends to a distance of 15m from public road or buildings then which of the following is to be observed mandatorily?

a) work is to be stopped b) workers are to be withdrawn
c) substantial fencing shall be erected
d) operational direction should be changed

75. As per DGMS Circular 7/2002, who out of the following shall be responsible to assess the requirements of support in underground?

a) overman b) mining sirdar **c)** shotfirer d) colliery manager

76. What is the minimum length of roof bolt used in underground coal mine?

a) 1/2 of the width of roadway b) 1/3rd of the width of roadway
c) equal to the width of roadway d) double the width of roadway

77. As per guidelines given in support plan, the bolting density at junction should be increased by

a) 15% b) 20% c) 25% d) 40%

78. Which of the following bolting density has been prescribed for poor types of roof?

a) 0.75 bolt/m^2 b) 1 bolt/m^2
c) 1.5 bolt/m^2 d) 2 bolts/m^2

79. The minimum anchorage strength of bolt after 30 minute and 2 hours of setting shall be

a) 1 ton and 2 ton **b)** 2 ton and 3 ton
c) 3 ton and 4 ton **d)** 3 ton and 5 ton

80. In order to monitoring support performance what minimum percentage of installed bolts shall be subjected to anchorage testing randomly

a) 4% b) 6% **c)** 8% d) 10%

81. After every round of blasting, support of roof and sides shall be tested at places within the zone of influence of blasting. Who decides this zone?

a) Overman **b)** Asst manager (blasting)
c) colliery manager **d)** agent

82. In order to assess the efficacy of the support requirement what percentage of bolts shall be subjected to destructive testing?

a) 1% b) 3% **c) 5%** d)10%

83. On receiving approved SSR, which of the following is the main duty of Colliery Manager?

a) send the copy to DMS
b) send the copy to DM
c) hand over copies to supervisory officials and assistant managers
d) give a copy to area safety officer

84. In freshly exposed roof area of developing working, which of the following support should be preferably used?

a) square set chock
b) timber prop of 15 cm dia
c) triangular chock
d) full column grouted roof bolt

85. When immediate roof is weak and lips of ledges are exposed then which of the following support is recommended?

a) a set of 2 or 3 cross bars duly lagged
b) 2 number of square cog
c) a line of timber prop
d) roof bolts

86. What is the name of associated support installing system with continuous miner?

a) plough b) quad bolter c) drop war wick d) tugger

Answers

71. d	72. a	73. b	74. c	75. b	76. b	77. c	78. c
79. d	80. d	81. c	82. a	83. c	84. d	85. a	86. b

CHAPTER - 8 : Q. 76-100 For Surveying

76. Which of the following is not a method under tacheometry?

a) stadia method
b) tangential method
c) fixed hair method
d) horizontal measurement

77. The following equation for stadia method show as –

$$D = \frac{f}{i} \quad S + (f + d), \text{ where}$$

$$\& \quad \frac{f}{i} \quad \text{is called as}$$

a) additive constant
b) constant multiplier
c) anallatic lens multiplier
d) image constant

78. The object of providing an additional convex lens is called –

a) tachometric lens
b) focal lens
c) anallatic lens
d) fixed hair lens

79. It is a mechanical device fitted to the vertical circle of a theodolite or to the telescopic alidade of a plane table –

a) subtense arc
b) beam and stadia arc
c) celestial arc
d) nautical arc

80. Which of the following statement is true in case of tacheometric survey?

a) It is not required to level the instrument w.r.t plate levels
b) It is not required to set vernier to zero
c) Tacheometer stations should be so selected that they give clear view.
d) To sight the staff held on the farthest mark

81. Which of the following statement is not true in respect of contours?

a) information regarding character of the tract of country is obtained
b) quantities of earth work can be computed from the contour maps
c) sections can be drawn in one direction
d) a route of a given grade line can be traced on the map

82. The vertical distance between any two consecutive contours is called –

a) horizontal equivalent
b) vertical gap
c) intervisibility between points
d) contour interval

83. If the broken ground is more then contour interval must be –

a) greater
b) smaller
c) equal
d) no impact

84. A uniform shape is indicated when –

a) contour lines crosses the ridge lines
b) contour lines crosses valley lines
c) contour lines are merged
d) contour lines are uniformly spaced

85. Absence of spherical method aberration is known as –

a) aplanatism
b) achromatism
c) magnification
d) conjugation

86. The graphical method of surveying in which the field work and plotting are done simultaneously is known as –

a) triangulation
b) traversing
c) collimation
d) plane tabling

87. The other name of subtense method in tacheometry surveying is –

a) tangential method
b) movable hair method
c) hammer-fennel method
d) self reducing szepessy method

88. A curve that consists of two arcs of different radii bending in the same direction and lying on the same side of their common tangent is known as –

a) reverse curve
b) simple curve
c) compound curve
d) complex curve

89. One of the important concept in the study of subsidence surveying is –

a) subtended angle
b) area of influence
c) subsidence interval
d) fracture point

90. The magnitude of lowering of surface is determined by –

a) collimation
b) traversing
c) triangulation surveying
d) subsidence surveying

91. Duties and responsibilities of surveyors are laid down in which provision of CMR 1957?

a) 48 b) 49 c) 50 d) 51

92. What should be the number of surveyors in underground mine where average monthly output is 10,000 tons?

a) 1 b) 2 c) 3 d) 4

93. The surveyor shall record in a bound paged book the full facts where workings of the underground coal mine approached ——— m from the mine boundary or from disused or water-logged working

a) 45m b) 55m c) 65m d) 90m

94. In which provision of CMR 1957 the requirement of Types of Plan has been statutorily given?

a) 59 b) 60 c) 69 **d) 70**

95. In relation to subsidence, it is obvious that the angle of draw determines the –

a) volume of coal extracted from below ground
b) depth of coal extracted at that point of surface
c) size of area of influence
d) effect of strains on the surface structures

96. In long wall workings, in a flat measure in order to get greater part of information, a single observation line should be laid

a) at any position
b) at right angles to the direction of advance
c) at any direction parallel to the advance
d) at a direction parallel to the top gate road

97. In order to get work of highest precision, which of the following tape is used for measuring base lines in triangulation?

a) synthetic tape b) inner tape
c) linen tape d) steel tape

98. Calculate the sag correction for a loom tape weighing 10 N under a pull of 100N in three equal spans of 100/3 m each.

a) 0.462m b) 0.0462m c) 0.00462m d) 0.000462m

99. Along with the application for depillaring permission which of the following plan has to be mandatorily submitted

a) water danger plan b) rescue plan
c) offset plan d) inundation plan

100. If surveyor fails or omit to show any part of plan or allows to keep a working plan as inaccurate then who else other than surveyor is held responsible as per CMR 64/4?

a) safety officer b) ventilation officer
c) workman's inspector d) colliery manager

Answers

76. d	77. b	78. c	79. b	80. c	81. c	82. d	83. a
84. d	85. a	86. d	87. b	88. c	89. b	90. d	91. b
92. b	93. c	94. a	95. c	96. b	97. b	98. c	99. c
100. d							

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